THE

JOURNAL OF GAS LIGHTING.

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XV. No. 345—18th YEAR.] LONDON, JANUARY 9, 1866. [Subscription per Ann. 15s. in Advance 18s. Credit.] DOUBLE No. Price 1s.

RAMSAY'S CANNEL COAL.
Analysis by LEWIS THOMPSON, Esq.:—

Specific Gravity.	Cubic Feet.	Illuminating Power.
600	9151	5 feet per hour. = 27·2 candles.

RAMSAY'S PATENT CONDENSED COKE,
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828.
FIRE-BRICK WORKS, established 1804.
FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire Clay.
The Fire Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article.
The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the works are the most extensive in the Kingdom.
Manufactories: DERWENTHAUGH, SWALWELL, and HEBBURN QUAY. Offices: BROAD CHARE, NEWCASTLE-UPON-TYNE. Address, G. H. RAMSAY.

IMPROVED GASLIGHT.

Most of the complaints made of deficiency of gaslight, and bad gas, arise from the unskilful combustion of the gas, and especially from the employment of bad burners. The atmosphere is thus rendered offensive and unwholesome, and becomes charged with smoke—an inconvenience that is especially felt in *churches, theatres,* and *public offices.*
By using proper burners, regulating the pressure, and *carburetting* the gas, it will be rendered the cheapest and most wholesome artificial light that can be used.
CARLESS, BLAGDEN, and Co., having been for many years practically engaged in manufacturing every variety of substance used for the production of artificial light, have for some time specially directed their attention to the subject of *carburetting* gas.
In conjunction with GEO. GLOVER and Co., an extensive series of experiments have been conducted with the greatest care, and by means of instruments of the highest scientific precision; and the result of their united efforts is, that the fluid and apparatus have been so improved as to give a real commercial value to the process of *carburetting* common gas. The most important result to be obtained from this process is that the light can be *doubled or trebled,* and that for an equal amount of light the production of heat and carbonic acid gas will be greatly reduced, even to less than the quantity produced by wax candles and oil-lamps.
Messrs. GEO. GLOVER and Co. will have pleasure in showing the apparatus in use, and in giving any explanation that may be desired. Architects, engineers, and scientific men generally, are specially invited.
For list of prices, and all other information, apply to
GEO. GLOVER and CO.,
WORKS, RANELAGH ROAD, PIMLICO, S.W.; or,
CARLESS, BLAGDEN, and CO.,
2, NEW LONDON STREET, E.C.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE-CLAY," and they have also been awarded in the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire-Bricks, and every other article in Fire-Clay are promptly executed at their Works as above.
COWEN'S GARESFIELD COALS.
Coal Office,
QUAY SIDE, NEWCASTLE-ON-TYNE.

FIRST PRIZE IN THE PARIS EXHIBITION.
JOHN RUSSELL AND CO.,
THE OLD TUBE WORKS,
CHURCH HILL, WEDNESBURY;
ALMA WORKS,
WALSALL, STAFFORDSHIRE;
and 69, UPPER THAMES STREET, LONDON,
Original Manufacturers of Wrought-Iron Gas Tubes and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.
Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.
N.B. All Goods thoroughly Tested before sent out, and Warranted.

THE MARQUIS OF LOTHIAN'S
CANNEL COAL.
This Cannel is extensively used in the Gas-Works of Edinburgh, and been so for Forty Years, and is well known to Gas Manufacturers throughout Scotland.
The yield per ton is 12,573 cubic feet, with an illuminating power equal to 33·8 standard sperm candles. Coke per ton by weight is 1046 lbs., by measure 26 bushels.
For price and other information, apply to Mr. JOHN ROMANS, Civil Engineer, 53, Frederick Street, EDINBURGH.

BLAYDON BURN AND LOW BENWELL FIRE CLAY RETORT AND FIRE-BRICK WORKS,
NEAR NEWCASTLE-ON-TYNE.
WILLIAM COCHRAN CARR begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the Manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other Articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.
London Agents: JAMES LAWRIE & CO.,
63, OLD BROAD STREET, CITY, LONDON.

A Gentleman, connected now, and for the past 15 years, with a well-known firm of high reputation in the gas apparatus trade, wishes to secure the AGENCY of several first-class firms for the sale of gas-mains, fire-clay goods, wrought-iron tube, &c., at present principally for the London district.
Address, G. E., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

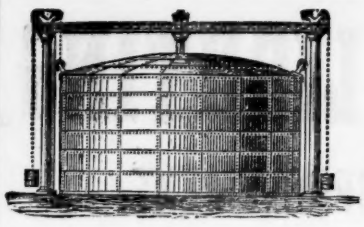
HIGH-PRESSURE GAS-METERS.
W. and B. COWAN
are the Sole Manufacturers of
NEWBIGGING and HINDLE'S
PATENT
"AIR-TIGHT INDEX-BOX."
See Advertisement, page 2.

Established A.D. 1782. Prize Medal Holders.
WILLIAM BLEWS AND SONS,
9, 10, 11, and 12, NEW BARTHOLOMEW STREET,
BIRMINGHAM;
AND 38, WEST SMITHFIELD, LONDON;
PATENTEES AND MANUFACTURERS OF
METAL AND GLASS CHANDELIERS, &c.,
IN THE PUREST STYLE OF ART. Also of
IRON TUBES AND FITTINGS,
FOR GAS, STEAM, AND WATER;
Steam and other Cocks in Gun-Metal and Brass; Stocks, Taps, and Dies; Gas-Hooks and Burners; Brass, Copper, and Composition Tubes; and every article required in the erection of Gas-Works.
ALL WARRANTED.

THE
LONDON GAS-METER COMPANY,
LIMITED,
GEORGE STREET, LANGHAM PLACE,
Manufacture and Supply their
NEW PATENT GAS-METER,
Whereby the Water-Line is always kept at the right level also their
NEW PATENT DRY GAS-METER,
AND
WATER AND SPIRIT METERS.

The great improvements in the construction of the (London Gas-Meter Company's) Patent Meters have received the approval of the most eminent Gas Engineers, and are now supplied to some of the largest Gas Companies, and are confidently recommended as very superior in their lasting qualities, workmanship, and correctness of measurement.
LEWIS BROWN, MANAGER.

JOURNAL OF GAS LIGHTING ONE PENNY NEWSPAPER



IMPROVED GAS APPARATUS,

FOR TOWNS, VILLAGES, &c.

INVENTED AND MANUFACTURED BY

W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD.

WILL BE SENT ON APPLICATION:—

PLANS, SPECIFICATIONS, and PRICES of GAS APPARATUS;

PLANS, SPECIFICATIONS, and ESTIMATES of the requisite BUILDINGS for each size of Apparatus;

PLANS of the IMPROVED ANNULAR CONDENSERS;

PLANS of the COMBINED PURIFYING APPARATUS, so eminently adapted for Exportation.

LONDON OFFICES—56, GRACECHURCH STREET, CITY.

*** *Please address letters to the Works at Huddersfield.*

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.—Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

HIGH-PRESSURE GAS-METERS.

MESSRS. WILLIAM & BENJAMIN COWAN beg respectfully to call attention to Messrs. Newbigging and Hindle's Patent

AIR-TIGHT INDEX-BOX,

Which supplies a want long felt by Gas Companies, and hitherto very inadequately provided for. The PATENT AIR-TIGHT INDEX-BOX prevents the ascent of water by the seal tube, even under the highest pressures. It is therefore of paramount utility in irregular and hilly districts, and even in level localities it is of great service, as it removes the objections to cork and other slide pendants.

As no raised Index is needed, Meters can be made of a convenient height, for fixing on shelves, under benches, or in any confined or limited space.

For a full statement of its advantages, apply to the Sole Manufacturers,

WILLIAM AND BENJAMIN COWAN,

WET & DRY GAS-METER MANUFACTURERS,

Buccleuch Street Works, Edinburgh, & 13, Strutt Street, Manchester.

Established 1827.

SOLE MANUFACTURERS OF

ESSON'S PATENT COMPENSATING GAS-METERS,

AND OF

KAY'S PATENT HYDRAULIC VALVE GAS-METERS; | **COWAN'S PATENT SIDE VALVE GAS-METERS;**

All of which may be had with Newbigging and Hindle's Patent Air-Tight Index-Boxes.

ALSO, MANUFACTURERS OF

IMPROVED DRY GAS-METERS.

All of the above being Stamped according to Act of Parliament.

GOVERNORS, STATION-METERS, PRESSURE REGISTERS & GAUGES,

MINUTE-CLOCKS, PHOTOMETERS, EXPERIMENTAL METERS,

AND OTHER DESCRIPTIONS OF GAS APPARATUS.

Established 1830.

JOHN BENT AND SON,

BELL BARN ROAD, BIRMINGHAM,

Manufacturers of the IMPROVED TWO-DIAPHRAGM DRY GAS-METER, with ROTATING VALVE, which entirely overcomes the objections so frequently raised against the usual kind of Slide-Valves, of tilting, &c., and allowing gas to pass unregistered. Particular attention is paid to the Diaphragms, and also to the mixture of the metals of which the Valve and Valve-Cover are composed, so that the meter works with less friction than any other.

A considerable number have been in use a sufficient length of time to prove them, and are giving every satisfaction.

Also, Manufacturers of COMPENSATING and ORDINARY WET METERS, in strong TIN-PLATE Cases, or EXTRA STRONG WROUGHT IRON These latter are lighter in weight than the usual Cast-Iron Case Meters, while they have the advantage of being so much stronger, and not liable to breakage from any cause. These Cases can be applied to meters in use at present, as they can be made to suit any size drums, and at a moderate cost.

All Meters stamped, unless ordered to the contrary.

Manufacturers of STATION-METERS, TEST GASHOLDERS, and STREET-LAMPS and REGULATORS.

NATURAL OXIDE OF IRON.

Messrs. W. DAWBER & SON,

QUEEN'S DOCK, HULL,

Who with several Gas Companies successfully opposed the prolongation of Mr. F. C. Hills's Patent for the Purification of Gas by Artificial Oxide of Iron, respectfully inform Directors of Gas Companies, Gas Engineers, and all interested in using the cheapest and most effectual material for the Purification of Gas, that they are now prepared to supply the NATURAL OXIDE OF IRON at a price per ton delivered, or to take Contracts by the ton of coal carbonized, receiving back the spent material.

References to several London and provincial Gas Engineers of the highest eminence can be given on application to W. DAWBER & SON, to whom all orders should be addressed.

Queen's Dock, Hull, March 28, 1864.

THE GAS-METER COMPANY

(LIMITED), LONDON,

(Successors to CROLL, RAIT, and CO., LONDON, and WEST and GREGSON, OLDHAM.)

MANUFACTURE

STATION-METERS & GOVERNORS

At their Oldham Establishment, which has long possessed the reputation of supplying this description of apparatus of the most perfect construction and appropriate design.

CONSUMERS GAS-METERS IN CAST-IRON & TINNED SHEET-IRON CASES.

STREET GOVERNORS, PRESSURE and EXHAUST REGISTERS, TEST GASHOLDERS,

AND EXPERIMENTAL GAS APPARATUS GENERALLY.

For information, &c., apply to

GEORGE RAIT, Managing Director, KINGSLAND ROAD, LONDON.

TO CORPORATIONS, GAS ENGINEERS, AND OTHERS.

HENRY ALDER,

GRANGE METER-WORKS, EDINBURGH,

Begs to intimate that he has introduced the manufacture of DRY GAS-METERS in

CAST-IRON CASES.

These Meters are protected by registration under the "Copyright of Designs Act." They are much more durable, and at the same time more easily repaired than those in Tin Cases.

Price list and terms on application.

KING BROTHERS,

STOURBRIDGE FIRE-BRICK AND RETORT WORKS.

KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Bars, Flues, and Quarries, are all Manufactured of the same quality of Clay.

Every Retort and Brick is branded "King Brothers, Stourbridge."

ANOTHER

MEDAL AWARDED BY THE JURY, INTERNATIONAL EXHIBITION,

1862,

To THOMAS GLOVER,

SUFFOLK STREET, CLERKENWELL GREEN, LONDON.

THOMAS GLOVER has great pleasure in informing Gas Companies and his other Patrons, that the *Jury of Class XXXI. of the International Exhibition of* 1862 have awarded, for his Patent Dry Gas-Meter, *a Prize Medal.* The reason given for this Award, in the Juries Official Report, is, "*For excellence of manufacture, as regards Dry Meters.*" See Official Report, p. 346.

It is worthy of remark, that the only two other Firms who receive Awards *both manufacture imitations of Thomas Glover's* Patent Dry Gas-Meter, and the reason given for these Awards is "*construction* and sound workmanship." Thomas Glover, therefore, claims that the *construction* of his Meter has obtained *three Awards from the Jury of the International Exhibition of* 1862; at the same time, *contrasting* the Award granted for his Meter by the words, "*For excellence of manufacture, as regards Dry-Meters.*"

The Prize Meter was exhibited in Class XXXI., No. 6301, connected with a 1-foot holder, to demonstrate that a 50-light Meter *measures and indicates accurately the small quantity of One Foot.*

WILLIAM PARKINSON AND CO.

(SUCCESSORS TO SAMUEL CROSLEY),

PATENT WET AND DRY GAS-METER MANUFACTURERS, &c.

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

PATENT IMPROVED WET METER.

W. P. and Co. invite especial attention to this Meter, which entirely overcomes the difficulty to which ordinary Wet Meters are subjected, owing to the short range of the Float, which is necessary, in order to meet the requirements of the Sale of Gas Act.

"It is well known that n Meters constructed so that the valve will close when the water is drawn off to such a point as to render them 3 per cent. slow the lights are liable to be extinguished by the closing of the valve by a sudden increase of pressure. To meet this difficulty, Mr. Pinchbeck has invented an ingenious and simple arrangement by which the action is reversed, and any such increase of pressure, in his Meter, raises the value instead of depressing it. The fact of the improvement having been adopted by Messrs. W. Parkinson and Co. is a sufficient guarantee that it practically and effectually remedies the inconvenience it is designed to meet."—JOURNAL OF GAS LIGHTING.

PATENT IMPROVED DRY METER,

Which W. P. and Co. pledge themselves to manufacture with the same quality of materials and workmanship as in their Wet Meter, thereby giving Gas Companies and others the advantage of procuring a first-rate Dry as well as a Wet Meter, which, hitherto, they have been unable to do.

STATION-METERS AND GOVERNORS.

Which can be seen at all the London Gas-Works. Also Liverpool, Manchester, Sheffield, Nottingham, Belfast, Glasgow, Birmingham, Dublin, Bristol, Leeds, Leicester, Brighton, Southampton, Sunderland, Wolverhampton, Bradford, Norwich, &c., &c.

TEST GASHOLDERS, EXPERIMENTAL METERS, EXHAUSTER REGULATORS,

MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

CONTENTS.

	PAGE
Notes upon Passing Events:—	
The Sewage Disposal Difficulty	5
Mr. Thomas Ellis and the Metropolitan Board of Works	5
Metropolitan Railway Projects	5
Extortions practised on Railway Companies	6
London Improvements	6
Mr. Cole and the Royal Academy of Music	7
The Casual Poor of the Metropolis	7
Leading Article:—	
Metropolis Gas Schemes	7
Circular to Gas Companies:—	
Retrospect of the Operations of Gas Companies for the Past Year	8
The Gas Legislation of 1865	8
Financial Mismanagement of newly formed Limited Liability Gas Companies	9
Correspondence:—	
The Perth Gas Companies	9
Paraffin Light	9
Mr. H. P. Stephenson's Suggestion for Preventing the Accidental Passage of Foul Gas into Supply Mains	9
Register of New Patents:—	
Rattray, R. G.—Apparatus for Supplying Regulated or Measured quantities of Water, &c.	10
Bousfield, G. T.—Apparatus for Vaporizing Hydrocarbon Liquids	10
Newton, A. V.—Securing Low and Uniform Temperatures	10
Kennedy, T.—Smoke-Vents or Chimneys	10
Newton, W. E.—Distilling Oil, &c., from Coal, &c.	10
Smith, H.—Gas-Engines	10
Goodfellow, J.—Combinations of Engines and Pumps	10
Roberts, W.—Cocks or Valves	10
Pennycook, C. H.—Constructing Gasometers, Tanks, &c.	10
Smith and Crease—Arrangement of Valves, &c., for a new Description of Hydraulic Engine	11
Williams, W. M.—Apparatus for the Distillation of Coal and Peat	11
Morant, W.—Argand Gas-Burners	11
Applications for Letters Patent	11
Grants of Provisional Protection	11
Notices to Proceed	11
Patents which have become Void	12
Parliamentary Intelligence:—	
Metropolis Gas Act Amendment Bill	12
Miscellaneous News:—	
Meeting of the Pará Gas Company	13
Flintshire Oil and Cannel Company	14
Sale of Gas Act—City of London Quarter Sessions	15
Researches on the Volatile Hydrocarbons	15
Composition and Quality of the Metropolitan Waters	19
Serious Fire at the Dundee Gas Company's Works	19
Professor Frankland's Analysis of the Metropolitan Waters in December	19
Share List of Metropolitan Gas Companies	19
Share List of Provincial Gas Companies	20
Share List of Water Companies	24
Price Current	24

ERRATUM.

The signature to the letter at page 913 of the last number should have been H. P. Stephenson instead of W. H. Stephenson.

TO CORRESPONDENTS.

G. W. (Swindon).—*The work you refer to is the only elementary one published on the subject.*

F. W. B.—*Mr. G. W. Stevenson has ceased to be borough engineer at Halifax, the duties of which office have been transferred to a borough surveyor and water-works manager. Mr. Stevenson's London address is 14, Park Street, Westminster.*

An Advertiser.—*An injunction from the Court of Chancery is the only mode of stopping the unauthorized insertion of advertisements in the publication referred to. In one case an account for advertisements inserted without any authority has been sent in and proceedings threatened for the recovery of the amount, and it is not improbable that other persons whose names have been similarly made free with may have been served in the same manner.*

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

Subscribers who have not paid their subscriptions for the year 1865, or for any previous years, are requested to remit the same forthwith in the manner indicated below, in order to prevent any interruption in the regular delivery of the Journal; and such subscribers as desire to avail themselves of the reduction in the subscription by paying in advance, must do so in the course of the month of January.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

This Journal has been duly registered at the General Post Office for transmission abroad.

The next number will be published on Tuesday, January 23, and the subsequent numbers on each successive alternate Tuesday.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JANUARY 9, 1866.

Notes upon Passing Events.

The question of the disposal of sewage daily becomes more difficult to all towns not so fortunately situated and managed as London, Edinburgh, and Croydon. In November, two decisions of two Courts of Chancery settled that towns have no right—in order to preserve the health of their inhabitants—to inflict a nuisance on any other district, and pollute streams heretofore pure. The Banbury case had previously been decided against the local authorities, on an application for an injunction, which had been granted. The local authorities, it seems, after the issue of the injunction, applied to Dr. Letheby and others to deodorize the contents of their sewers. The experiments failed, and thereupon they sat down, folded their hands, and did nothing. They felt completely beaten by the discouraging advice of the doctors consulted. They were told that irrigation would not answer on the neighbouring retentive soil, and so stood silent in sulky despair. Vice-Chancellor Sir Page Wood, whose motto seems to be "thorough," had no mercy on the puzzled Banbury Board of Health, but, after due recapitulation of their manifold sins and offences, ordered a sequestration of their effects, wherever found. It remains to be seen what this strong measure will do for the sewage of the town of cakes. In the other case, the unlucky defendants are not so near execution, having only reached the first stage of judgment. It seems that, in their endeavours to cleanse Tunbridge Wells, and introduce the latest sanitary arrangements in the way of house drains, street sewers, and water supply, the local authorities have befouled a once pure stream, and thus turned a small lake which it fed in Sir F. H. Goldsmid's park, into a sort of cesspool. The Master of the Rolls has granted an injunction, leaving the defendants full time to appeal, as he feels certain, from past experience, they will. Sir Page Wood's decrees are generally sustained by Sir John Romilly. If it becomes part of the settled law that every town is to consume its own sewage nuisances, many will be placed in a dilemma only to be solved by a return to the old-fashioned plan of open privies, dust, and ashes.

From the newspaper articles of the friends of Mr. Thomas Ellis, it seems that he has not yet settled his little bargain with the Metropolitan Board of Works. There are complaints that the chairman and the engineer are not using the imaginative ex-attorney, ex-contractor, fairly. Probably the truth is, that Mr. Ellis finds a difficulty in getting his capital for his ridiculous scheme, and wants to back out of his bargain under the shadow of a quarrel. As for the Metropolitan Board, it has nothing to do with the agricultural plans of this imaginative speculator; it has only to secure, at some person or company's expense, a reservoir at the river side, from which the sewage may at the worst be poured into the river, as far as possible from inhabited districts. The Board has to get rid of a nuisance, and will leave the utilization of sewage to other hands.

The Private Bill Committees of Parliament will be occupied with the usual, or rather an unusual number of schemes. In railways, the increasing success of the Underground extensions will give strong support to all branches on that plan. The opening of the Finsbury station has tapped the largest traffic in the world. Ninety thousand passengers in one day through one station have given some idea of what may be expected when the circle is completed through the Tower district and Cannon Street. Up to the present time the season ticket business of railways, with rare exceptions, has been most imperfectly developed, because the necessity of a long walk or the cost of a cab have always been tacked on to the season ticket. But now that a few minutes will carry the banker, broker, or merchant, from Finsbury to the Bishop's Road, the Great Western will see quite a different sight along its line, so unrivalled for villas and fancy farms; while the Ludgate station will open up a new season ticket business to Hertfordshire and Middlesex, as well as to Kent and Surrey. The junction of the Metropolitan, and, through it, the Great Northern, Great Western, and Midland, with the Chatham and Dover, will

very soon let us know what can be done in a southern railway coal traffic. The London and North-Western, as usual, lags behind in its attempts to obtain a central station, after most foolishly neglecting the advances of the Metropolitan. The Act for making a junction with Charing Cross has proved a dead letter. The promoters, to get their Bill, agreed on impossible terms; amongst others, to tunnel through Tottenham Court Road without an opening for carrying away spoil, and to build a magnificent street through St. Giles's. An amending Act is to be applied for this session, in which the inconvenient parts of the bargain are to be, if possible, omitted. In the meantime the Great Northern, the Midland, and the Great Western will all have tapped the City and left the senior wrangler "out in the cold," as the Americans say. The Brighton Company will be again attacked by the combined forces of the South-Eastern and the Chatham and Dover seeking to push on from Kent into the tempting traffic of Brighton. The Brighton Company have issued a circular reproaching the South-Eastern with bad faith. That is a private question. The public question is, "Do the people of London "want another line into Brighton?" As for the legal questions between the rivals, no one outside the shareholders cares to weigh the pros and cons. Public opinion seems to say the Brighton Railway has too much to do, and a couple of new stations between Ludgate Hill and Charing Cross, with one at the bottom of the hill in Brighton, would be mighty convenient. The promoters of the pneumatic line between Waterloo station and Whitehall are so sanguine of success that they are already applying for extensions from the parent branch. How public feeling changes! What a mass of medical evidence was brought together to show the sanitary dangers of tunnels on the old Birmingham line through Watford. Even so late as Brunel's Oxford and Birmingham line, that imperial engineer made enormous sacrifices of the shareholders money to supersede all tunnels by formidable cuttings. Next, the Underground Railway was made and patronized in the face of most doleful and not altogether unfounded forebodings of cold caught and lungs oppressed by mephitic vapours; and now preparations are being made to blow the public regularly from side to side of the river through an iron tube, like peas in a boy's tin shooter. In this way, at any rate, in spite of the obstructiveness of Christ's Hospital, the London streets will be relieved of letter-carriers carts, and the light parcel traffic will be concentrated in districts.

We hear sometimes of the cruelties perpetrated by railway companies on tenant-at-will and other householders whose trade they destroy. It may not be amiss to turn to the other side of the question, and look at the extortions practised on railway companies. A recent example is afforded in the negotiations between the St. Pancras guardians and the Midland Railway. The Midland want the four acres on which the St. Pancras Workhouse stands. It is a building altogether unsuited to the present requirements of the parish and the age we live in—fixed on a very bad situation, without sufficient accommodation for the number of inmates who have claims, and specially deficient in the hospital department. It is admitted that to remove the asylum for permanent paupers to the country, to an edifice on the best modern plan—to add an infirmary, industrial gardens, or a farm—to collect the children now farmed out—would be in itself a great reform, and an economy in concentration of staff. It would be necessary, however, to build a casual relief ward and vestry-hall in a central situation. The Midland Railway are, of course, willing to give about double the worth of the land and house, or to build a workhouse of the same cubical contents in the suburbs. The St. Pancras surveyor has made out an estimate, in which, after charging £5000 an acre for the land, and £100,000 for rebuilding the workhouse, he tacks on £5000 for artesian wells, £2000 for gas-works, and £55,000 for estimated extra expense for drawing stores, &c., to a suburban workhouse! We do not think the conscience of a surveyor could be stretched further. Why not charge for the summer coats and garden-hats of the guardians?

The improvements in London contemplated and in progress seem numerous and important in a catalogue, but they are insignificant when compared with those of Paris, where a tax on eatables produces a constantly increasing revenue, without counting the large assistance given by the State. In London almost every above-ground work has to come out of a tax on coals. We have no minister bold enough to propose a municipal tax on meat and fish, potatoes and cabbages. The expenditure of the City of Paris for the past year amounts to £8,000,000 sterling, of which £4,280,000 was applied to the construction of public promenades, plantations, and road work. A large sum was expended on sewers; but, after fifteen years continuous labour, the sewers of Paris are only 250 miles in length, while those of the City of London alone amount to nearly 1000 miles. In a few years, at the present rate of progress, Paris will be completely sewered, but as much solid sewage has to be carted away, the efficiency of the system cannot be compared to that of the metropolis, where we have the advantage of a tidal river for the final reception of the surplus contents of our drains, large and small, after the agriculturists shall be satisfied. Parliament will no doubt willingly grant the Metropolitan Board the necessary powers for completing the Northern Thames Embankment by streets of access, including the grand road through the site of Northumberland House and Mr. Stanford's map shop. One side of Parliament Street seems also officially doomed in order to throw light upon the new Government offices. But some private and praiseworthy speculators stimulated by the idea have lodged an audacious plan for reconstructing all Parliament Street, and the worst part of Westminster to boot, and replacing slums by palatial blocks. If this great scheme should pass the straits of the days of deposits and Standing Orders, we trust that Parliament will put aside its usual jealousy of building speculations, and give as much encouragement to capitalists willing to invest in architecture as has hitherto been given to the promoters of railways, and canals, and docks. The preliminaries for the Palace of Justice are advancing slowly, but surely. On the strength of this clearance other speculators propose to sweep away Holywell Street, except that rival to the Nelson Column, in slowness of construction—the Strand Hotel. Perhaps in time the Common Council and Lady Jersey will consent to part with that hideous nuisance, Temple Bar. One step towards its abolition would be to extend the traffic regulating powers of the City, under the Bill about to be laid before Parliament, to Charing Cross. There are times and places where City powers may properly be exercised, but this is one where the public would benefit by their extension. One rule for the regulation of wheeled traffic between such a natural line as between Charing Cross to the Bank, would save a serious waste of time and money. The Metropolitan Board and the City Gas-Works have not yet come to a perfect understanding, but it seems generally believed that a bargain will finally be struck and a solid embankment made, which will run unbroken, except by the Palace of Westminster, from Blackfriars to the foot of old Chelsea Bridge. The greater part of the property for the new Mansion House Street has been purchased; so there is a prospect that it will be opened if not completed as soon as the embankment. Whether the little bit of old Mansion House Street which the Corporation have been growling over for the last ten years will by that time be sliced down to a reasonable width may be doubted. And then there is the Poultry—that standing disgrace to the City of London; must that be left for the Metropolitan Board to take in hand? It looks very like it. And yet there are residents in the City who can do great things—for instance, the £50,000 middle-class education fund already made secure. Returning west from the Mansion House, it may be expected that in some shape or other the Holborn Hill viaduct will be completed. The committee have not had the pluck to put on one side the extravagant officer who wriggled himself into the position of architect when he was elected to act as a superior clerk of the works, in order to protect the City from the vagaries of architects and the dishonesty of contractors. The committee, brought to a dead lock by the excess of £150,000 of Mr. Jones's plans over the estimates on which Mr. Haywood carried the Holborn Viaduct Bill through Parliament, did the next best thing they could under the circumstances—referred the whole question for a report to Mr. Cubitt, the engineer of Blackfriars Bridge. Mr. Cubitt has reported, and unequivocally condemned the extravagance of Mr. Jones's plan, extravagant even after the contractor, Mr. Myers, had offered to reduce his estimate by £40,000! We shall see whether the committee will prefer to serve the Corporation or their friend Jones. The Metropolitan Board is looking on, and will be only too glad to have a new case of inefficient extravagance. It is to be hoped the committee will be wise in time, and, gently excusing the architect on the ground of his heavy duties in West Smithfield, will make such a bargain with the author of the plan approved by Parliament as will give them

credit for economy in every department—in architectural supervision as well as construction. Mr. Haywood knows every detail and every inch of ground as well as he knows his own house and garden; and while his economical plan has been virtually approved in Mr. Cubitt's report, he would (as a salaried officer of the City Commission) of course be content with a much smaller remuneration than an outside architect or engineer. The committee will have to decide between the feelings of Mr. Jones and the pockets of the citizens of London—between supporting and deeply injuring the power of the Corporation. A little north of Holborn we are told that the plans of the Smithfield dead meat market are at length settled. The result in brick and stone will be waited for with anxiety by those who have seen the Paris *halles*. Holborn Bars, the other nuisance of the second greatest thoroughfare in the world, are also doomed; but as yet there are no signs of a breaking into Lincoln's Inn Fields or an opening up of Great Queen Street. If to these clearings and buildings be added a list of the metropolitan railways in progress and in plan, London seems reforming pretty fast. But still the Strand and Holborn will remain mean and squalid, and Regent Street poor and paltry, in an architectural point of view. It is a pity that Messrs. Lewis and Allenby, Mr. Emmanuel, and a few other shopkeepers of the same spirit, could not be made architectural dictators of their districts. In the City the force of example is stronger than in the West, and palaces for banks, insurance companies, and financial associations, are multiplied daily, with the sole drawback that to see most of them you must lie on your back in the middle of the pavement.

Our shot at the intentions of Mr. Cole has been singularly realized by his recently published evidence. His pecuniary demands on behalf of musical education are rather more extravagant than we could have anticipated. He asks for a parliamentary grant of £8000 a year, and counts on £4000 a year from other sources. He proposes to remove the Royal Academy of Music from Hanover Square to South Kensington, to remodel its constitution, and endow it with a complete building, including a theatre. The main object being to discover and cultivate "fine voices," and bless the nation with more Sims Reeves and Clara Novellos. Well, Mr. Cole if comical is consistent. This is only a new phase of "art "manufacture."

By degrees the attempt to relieve the metropolis of the scandal of crowds of homeless destitute people in the streets will be successful. Mr. Farnall, as the representative of the Poor Law Commission, has lately had a friendly interview with the representatives of all the metropolitan parishes. His object was to bring about uniformity in the treatment of what are technically called casuals. London, as the great centre of wealth and employment attracts armies of the destitute. Some thousands enter the metropolis daily. The object to be sought is to treat with due consideration the unfortunates who are unwillingly and temporarily obliged to apply to the poor-house, and at the same time to place every obstacle in the way of sturdy rogues who seek to exchange a tramp's lodging-house for free quarters at a casual ward. It is very difficult to distinguish between these two classes; but to a certain extent it can be done. For the future the food given to casuals will be uniform in quantity and quality. That is a step towards discouraging professional paupers. We cannot be too tender to the sick, to women and children reduced to want by the accidents of life; but as regards professional beggars, the only remedy is to treat them as the drunken incapable are treated. Let the law authorize the police to bring before a magistrate all of the large class whom they know as "permanent paupers." The system of reports in the daily papers and the dislike of police authorities to unnecessary duties, will protect the public from any abuse of this power. On the Continent the police are irresponsible, and police reports, except of amusing cases, are unknown. Our jealousy of police power, once very needful, is often exaggerated. The English system of publicity is a more effectual protection against police despotism than any Act of Parliament. Amongst the labouring poor there are always a large number—*not a class*—on the verge of destitution. They live from hand to mouth. Judicious assistance helps most of these back to the ranks of the wages-earning. But a pitiless war ought to be waged on the professional beggar. It is our exaggerated respect for the liberty of the subject that makes London look to be so much more afflicted with pauperism than Paris. Every Frenchman not looking as if he did support himself is liable to be called to account and arrested by the police, and, if unable to show how he gets his living, sent to prison as a vagabond. Children begging, in like manner are consigned to poor-houses or reformatories. We shall have to imitate these preventive laws if we wish to crush in the bud a mass of incipient pauperism. There are a great number of good people who have no idea of the charms of a vagabond life, and who cannot understand how others prefer to sleep under a hedge or a haystack, and live in rags and on broken or pilfered meat, in order to rise when they please, work only when they please, and have the liberty of idleness instead of regular hours, regular work, regular food, and decent clothes. Such a class—always a numerous one—floating between thievery and casual labour, is mightily encouraged by indiscriminate alms and easy poor-law relief.

METROPOLIS GAS SCHEMES.

The schemes proposed for supplying London with gas are more comprehensive and threaten to make greater inroads in the property of gas companies than any that have hitherto ventured to claim the sanction of Parliament. The Metropolis Gas Act Amendment Bill and the City of London Corporation Gas Bill propose to effect the object by different means and in different degrees, but they are both alike in the intention of taking the supply of gas from the hands of the existing companies. The former, though nominally promoted by the Metropolitan Board of Works, has been repudiated by the chairman, Sir John Thwaites, and the actual promoters of the project, we believe, are Messrs. Hughes and Beal, who were the instigators and prime agents in the concoction and parturition of the bantling they are now endeavouring to destroy. According to their present designs, not only the thirteen companies to which the Metropolis Gas Act applies are to be sequestrated, but the Crystal Palace District Company, the Woolwich, Plumstead, and Charlton Consumers Company, and the Wandsworth and Putney Company are to be included in the scheme for the extinction of the metropolitan gas companies. Why the Woolwich Equitable Gas Company has been omitted does not appear, but it probably owes its escape to the ignorance of the promoters of the Bill that such a company was in existence. The seeming voracity with which the parents of the Act of 1860 now seek to devour their own offspring exceeds in monstrosity any recorded tales of infanticide and cannibalism, and we can scarcely believe they have any serious intention to put their threat in execution. Their object must be merely to ascertain how far public opinion will revolt from such a scheme, or, in other words, their Bill is intended to serve as a pilot baloon to indicate the direction and strength of the wind that is blowing against the metropolitan gas companies. Looking at it merely in that light, however, it deserves consideration as the exposition of the sentiments of some speculative dreamers which might possibly have influence on those who are ignorant of the facts and circumstances that render the realization of such a notion impracticable in the manner proposed.

The loose way in which the Bill is drawn bears out the supposition that it intended only as *brutum fulmen*. Without any previous allusion, except in the title, to the proposed transfer of the existing properties and powers of the gas companies, the sixth section abruptly limits the maximum price to be charged for gas by the Metropolitan Board of Works to 4s. 3d. per 1000 feet for cannel gas and to 3s. 6d. for common gas, though no standard of illuminating power is mentioned. After thus stating the terms on which the Metropolitan Board are to supply gas, the Bill proceeds to confer on that body power to purchase, either compulsorily or by agreement, the works of any of the gas companies named; and the vestries and district boards are also to be authorized to combine together to form a District Lighting Board, to which similar powers are to be given. In case the gas companies and either of those boards cannot agree on the amount of the purchase-money, then the Board of Trade are to fix terms, taking as the basis of their decision the current market value of the shares on the 1st of January, 1866, and to provide also compensation to the officers of the gas companies whose undertakings are intended to be purchased. The Metropolitan Board, or the District Lighting Board, are to have power to borrow money for the purchase of the works, and to levy rates for the payment of the interest. Power is to be taken also to purchase lands beyond the radius

of five miles from Charing Cross, for the erection of other gas-works, and to open the streets without any notice. These are the main provisions of the Bill.

The first difficulty that presents itself to carrying such a measure into operation is, that the limits of none of the vestries or district boards of the metropolis correspond with the limits within which any one of the gas companies is authorized to supply gas, nor has the Metropolitan Board of Works jurisdiction over the whole of the districts supplied by the sixteen gas companies. But there are still more formidable difficulties to be encountered, and we need not wonder that the Metropolitan Board have repudiated the scheme. Sir John Thwaites's parliament contains too many shrewd members to be caught by a proposal to supply cheap gas at the cost of the ratepayers. On the proposed basis of valuation, it would require at least £8,500,000 to purchase the property of the sixteen gas companies named in the Bill, besides upwards of £500,000 of money borrowed; and the amount of compensation to be provided for the officers of the companies, whose services would not be required. At least ten millions sterling would have to be raised for the purpose; and when it is borne in mind that the value of the property would be estimated in accordance with the existing prices of gas, which it is proposed to reduce subsequently at least 20 per cent., the ratepayers would have good cause for alarm. Even supposing the money could be borrowed at the rate of 4 per cent., there would be an annual charge of £400,000 for interest to be provided for, with a greatly diminished revenue, and the risk of the mismanagement almost necessarily consequent on conducting so gigantic an undertaking by a public body.

There is, however, little chance of the passing of the Bill in its present form. The 16th section would probably prove fatal to it on Standing Orders, one of which requires the precise spot whereon it is proposed to erect gas-works to be specified, whereas by the terms of that section the Board might, if they obtained the power required, erect gas-works close to any gentleman's house, provided it was situated farther than five miles from Charing Cross. Though the Metropolitan Board of Works have repudiated all connexion with the Bill, the promoters intend, if they can, to saddle them with the costs, for by the last clause it is provided that all the expenses incident to the preparing and applying for, and passing the Act, and preliminary thereto, shall be paid by the Board. We conceive that that body will scarcely be so meek-spirited as to allow such an impudent proposition to be unopposed.

The City of London Corporation Gas Bill, though limited in its object to the supply of the City, is far more extended in its requirements than that of Messrs. Hughes and Beal. The latter—however monstrous as proceeding from the parents of the Metropolis Gas Act, and in its demands on the pockets of the ratepayers—is not at least based on injustice. What the promoters require they propose to pay for, but the Corporation of London, in violation of the principles of fair dealing which regulate the conduct of the citizens individually, require to be authorized to destroy the vested interests bestowed on the existing companies by several Acts of Parliament without any compensation. They desire to obtain power to erect separate gas-works, to lay down new mains, and to employ the funds of the Corporation to compete with the companies who now supply the City, by selling gas at less than cost price. To expend half a million of money in the construction of gas-works, on which amount £25,000 would have to be annually paid for interest, and to supply 18-candle gas at the charge of 3s. per 1000 feet, without incurring loss on the undertaking, would be impossible. It would be equally impracticable, by any known process conducted on a large scale, to manufacture gas from Newcastle coal so free from sulphur as to contain only 16 grains in 100 cubic feet. The scheme is a bid for popularity, without regard to practicability or justice, that is disgraceful in such a body as the Corporation of London, and it shows how easily popular assemblies may be led astray, when ignorant of the subject they undertake to discuss, by a few ardent speculative individuals who, with a pretence of knowledge, are really as ignorant as themselves. At the recent wardmotes, the subject of the proposed application to Parliament for power to enable the Corporation to manufacture and supply gas was generally brought forward, for the purpose of giving additional force to the application, and with two exceptions the proposition was favourably received. The supply of a superior quality of gas at a reduction of one-fourth of the price is no doubt very desirable, if it can be fairly procured; but those who make such a proposition carefully abstain from alluding to the probable increase of taxation that would be necessary to obtain it. In the wardmote of Cheap, Mr. Bontems, the chairman of the Corporation Gas Committee, spoke rather despondingly of the chance of success of the Bill in Parliament, where he rightly predicted it would be strongly opposed; and in Vintry wardmote a few plain facts stated by Alderman Gabriel, who is connected with the Great Central Gas Consumers' Company, had the effect of cooling the ardour of the advocates of "cheap gas," and an amendment was carried requiring further information before the proposition was approved. Parliament cannot, without departing from all precedents, sanction the competition of a corporate body with established gas companies so long as the latter can be proved to have adhered strictly to the conditions on which they were empowered by their several Acts to exercise the privileges granted to them.

Circular to Gas Companies.

At the commencement of another year we have again the pleasure to congratulate the gas companies of the United Kingdom on the success which, with a few exceptions, has attended their operations during the year that has passed; and, in unison with the good wishes generally interchanged at this season, we cordially express the hope that there may be many similar prosperous returns. It is also in accordance with this season of the year to recommend, as one of the best means of ensuring continued success, the practice of a conciliatory policy towards those who depend for what is now considered one of the necessaries of civilized life on gas companies, and who are naturally extremely sensitive of anything approaching oppression on the part of those who monopolize the supply. Courtesy of manner and a readiness to reduce the price of gas when reductions are possible tend to strengthen the position of gas manufacturers, and will be found eventually not only the most pleasant, but the most profitable mode of conducting their business. The only check to the increase of general prosperity during the past year has been an advance in the price of coals, and we regret to add that a further advance is anticipated. Increased consumption of gas has, however, compensated for this drawback to some extent, and has enabled gas companies to maintain their usual dividends notwithstanding the increased cost of production, which has been augmented also by the difficulty of disposing of the residual products, consequent on the larger quantities of coke, &c., thrown on the market. The cloud which has for some months past hung over the metropolitan gas companies and reduced the market value of their shares, is, we believe, merely a passing one. Stimulated by the payment of back dividends, the prices had been in some instances driven up unreasonably high, and a reaction might have been anticipated whenever the exciting cause ceased to operate. At the present prices, the shares of the metropolitan companies will pay investors on an average 6 per cent., which appears to be the value in the estimation of the public of well-established gas property, though there are exceptional cases in the provinces in which investments are made on terms that will yield not more than 4½ or 5 per cent.

The gas legislation of 1865 is to be remembered chiefly by the abandonment of the principle of requiring all the new shares to be sold by auction. The general limitation of the dividends on such shares to 7 per cent. is considered a fair compromise between the rights of the public and the claims for reasonable remuneration of those who at great risk originally founded gas undertakings. The plan of selling new shares by auction, and thus giving to the public the profit which the enterprise and capital of the founders of the companies had been the means of earning, may now be considered to have been abolished.

In the applications to Parliament for Acts of incorporation in the ensuing session, there is an unusually large number from companies that have hitherto been carrying on their business without statutory powers. We are glad that so many unprotected companies have adopted the course which we have from time to time strongly recommended, and we trust that others will follow their example. Such a protection is especially necessary in all cases where the local authorities exercise jurisdiction over the highways, for the gas companies that do not possess the authority of Parliament to break open the pavement to lay down their mains, are thus completely at the mercy of the Local Boards, and in their hands mercy is not

usually a quality "that droppeth like the gentle dew from "heaven."

The congratulations we address to the gas companies of the United Kingdom cannot be extended to numerous companies formed within the last three years, on the limited liability principle, to carry gas lighting to the four quarters of the globe. It will be seen, on reference to our share list, that the shares of most such companies are more or less at a discount, and some are absolutely unsaleable at any price. The onerous conditions of the concessions granted to promoters of companies for lighting foreign towns when deliberately considered may serve to explain this unfavourable position of affairs with regard to some companies; but the majority of the disappointments of once promising schemes may be traced to the insufficiency of the capitals subscribed to meet the expenditure to which the companies have been committed. We mentioned recently the case of one company, with a large subscribed capital, but only one-half of which had been paid up, that was compelled to issue 7 per cent. preference shares in order to pay off 6 per cent. debentures falling due, and to meet the expenditure on new works. Another and more glaring instance of financial mismanagement is indicated in the offer recently made to the public by the Continental Gas and Water Company, Limited. That company started in 1863, with a brave list of directors and a nominal capital of £100,000, for the alleged purpose of supplying the wants of many towns in France, Germany, and elsewhere, with gas and water, it being well known, as the prospectus stated, "that there are numerous towns yet without "gas of sufficient importance to render gas-works remunera-"tive." The high dividends paid by some English companies who supply gas on the Continent were paraded to show what a lucrative investment of capital the purchase of shares in the new continental company was likely to become. Of the 5000 shares of £10 each which it was proposed to issue in the first instance, only 2271 were subscribed for on the 30th of June, 1864; and subsequent attempts have been made to raise the capital to £200,000, but they have not been successful. At the first meeting of the shareholders, the directors announced that they had purchased the water-works at Arras, in France, and had obtained a concession for lighting Port Louis, the capital of the Mauritius; and in subsequent meetings they "had great pleasure in reporting" the success of the operations in those places. The chairman, at the meeting of the company held in August, 1864, expressed confidence that, so far as human foresight could be relied on, the dividends would amount to 15 and 10 per cent. Even at the meeting in October last, the directors still "had great pleasure in reporting" continued success, but they hinted that the heavy expenditure in completing the gas-works at Port Louis would oblige them to have recourse to a financial operation, the extraordinary nature of which is developed in a circular since issued. The company propose to issue 1000 debentures of £100 each, bearing interest at the rate of 6 per cent. per annum, at a discount of 20 per cent. It is stated in the circular that "the "above price of issue will give to the holders interest at the "rate of 7½ per cent. per annum and a cash bonus of 25 "per cent. on the redemption of the debentures, a por-"tion of which will be redeemed annually by drawing at "par." It is asserted, as an additional inducement to capitalists to apply for shares, that the minimum income to accrue from the property at Arras and Port Louis is calculated to amount to £10,000 per annum, which will be more than sufficient to redeem the whole of the 7½ per cent. debentures, and to pay 10 per cent on the paid-up capital. The security is said to be so unquestionable as to justify trustees to invest the funds at their disposal in the debentures, which are offered also with equal liberality to those who are not inclined to risk more than £10 in the venture. It is clear that the financial difficulties of the company, which have rendered it necessary to raise money on such onerous terms, have been caused by their having committed themselves to engagements beyond their available means. The water-works at Arras and the gas-works at Port Louis constitute the security offered to the debenture holders, but the estimated profit from those sources is not supported by any satisfactory evidence. The concession for lighting the latter town was snatched by the Continental Gas and Water Company from a company acting under Mr. Hawksley's direction, by the offer to accept terms which the latter refused to comply with. We believe the concession contains a clause which gives power to the municipal authorities to terminate the contract at any time they see fit. If that be the case, the 25 years monopoly relied on hangs by a very slender thread, and should the expectations of the directors be realized, the cupidity of the authorities might be excited, and the large revenue in prospect might be reduced to a claim for compensation for the surrender of the contract.

We have been induced to dwell more on this subject than we otherwise should, because we think it desirable in the interest of the public to explain the cause of the present depression in this class of securities, and in the hope that the promoters of such undertakings will in future avoid rushing heedlessly into engagements which they have not funds in hand to meet, otherwise they may fall short at a time when the Bank rate of discount is 8 or 10 per cent., and when money can only be raised at exorbitant rates of interest.

Correspondence.

THE PERTH GAS COMPANIES.

SIR,—It may interest you to know that since Mr. Flintoff's advice was followed out by the Perth New Gaslight Company in 1861 (which was to reduce the price from 7s. 6d. to 5s. per 1000 cubic feet), their stock, £15,000 in £5 shares, which was then yielding a dividend of 6 per cent., and selling at 20s. per cent. premium, has never since paid one farthing dividend, and the selling price of their shares is reduced to 3s., and no buyers. The old company, who disregarded such advice, continues to prosper.

A SHAREHOLDER IN THE OLD COMPANY.

Perth, Dec. 27, 1865.

PARAFFIN LIGHT.

SIR,—The "waste product" of the "Flintshire Oil and Cannel Company, Limited," with which that company seeks power to light Chester, is no doubt *gas* obtained by the distillation of the cannel of the district for oil.

It may perhaps not be generally known that at however low a heat coal or cannel is distilled, there is nevertheless a certain quantity of *permanent* illuminating gas which refuses to be turned into oil; and it is this, I apprehend, for which the above company are seeking powers to supply Chester at 3s. 6d. per 1000 cubic feet. My own experiments in distillation for oil give from 1000 to 2000 cubic feet per ton as the yield of permanent gas, depending upon the heat and the quality of the cannel distilled; and as it is likely this company may be distilling from 50 to 100 tons a day, it will be seen that they have thus a large quantity of gas which they cannot utilize, except for heating purposes, and in this respect 1000 cubic feet only equal in value *sixpence* in coal of the district.

St. Neots, Jan. 1, 1866. GEO. BOWER.

MR. H. P. STEPHENSON'S SUGGESTION FOR PREVENTING THE ACCIDENTAL PASSAGE OF FOUL GAS INTO SUPPLY MAINS.

SIR,—Having read in your valuable JOURNAL of the 26th ult. a suggestion made by Mr. Stephenson for preventing foul gas from passing into gasholders, and knowing that directors of gas companies sometimes greatly trouble their engineers with propositions of various kinds, I would venture to suggest that there are material practical objections to the method Mr. Stephenson brings forward.

It is well known that in recharging a purifier it is impracticable to get rid of the whole of the atmospheric air, and, therefore, in applying a purifier in the position suggested by Mr. Stephenson, at each change of the purifier the gas will be considerably lowered in illuminating power, and this will be instantly felt by the consumer. This reduction, it is true, would be only momentary, but it might so happen that it would occasion very considerable inconvenience.

Now, inasmuch as the quantity of gas required during the *heaviest hours of consumption* is at least three times the average quantity manufactured each hour throughout the twenty-four, it is evident that this purifier, placed in the position proposed, would require to be of three times the size it need be if employed in the ordinary way.

There is no danger of foul gas passing into the gasholders, provided that there is ordinary care exercised by the operators, and that the purifiers, placed as at present to purify the gas before it enters, and gradually as it is manufactured, are adequate to the quantity of gas that has to be passed through them; but to make assurance doubly sure, let it be an instruction to the engineer to have such a number of purifiers as will at all times be sufficient to purify the largest quantity of gas made. Then place a reserve purifier so that the gas shall pass into this reserve purifier in a state in which it will not affect acetate of lead paper, and let this last purifier be charged, not with oxide of iron, although it is a child of my own, but with lime, for reasons which will be well understood by competent gas engineers.

A. ANGUS CROLL.

10, *Coleman Street, London, Jan.* 5, 1866.

Register of New Patents.

707.—Robert Gordon Rattray, of Aberdeen, M.D., for "*Improvements in apparatus for supplying regulated or measured quantities of water and other fluids.*" Provisional protection only obtained. Dated March 13, 1865.

For the purposes of this invention, a vessel of the cubic capacity requisite for supplying a desired quantity of water or other fluid is employed, and by preference of a cylindrical form, with conical or hemispherical ends; but vessels of other shapes may be used. At the upper end of this vessel is fixed, or formed, a cylindrical supply passage, which at its lower end rests on a stationary valve supported by a valve-rod, the upper end of which is fixed in and suspended from a bracket or other fixed support. The valve-rod passes through a stuffing-box at the upper end of the supply passage. At the upper part of the measuring vessel is an air-valve which opens by its own weight, but is closed by a float which is caused to rise when the vessel is full of water or other fluid. The water or other fluid is supplied to the measuring and supply vessel, by preference, by a flexible pipe or tube connected to a branch pipe or the supply passage before mentioned, or the vessel may be otherwise supplied with fluid. At the lower end of the measuring vessel is fixed an outlet passage having a valve to cover or close its upper end. The stem of this valve rests on a crossbar fixed on the interior of the upper end of a vessel into which the outlet-pipe of the measuring vessel has been filled, and has been allowed to descend, it rests on and is supported by the upper valve, whilst the lower valve, by reason of its not being allowed to descend with the measuring vessel, becomes open and the water or other liquid flows out therefrom; when the vessel is raised the lower valve becomes closed and the upper one is opened, and the water or other fluid flows into the measuring vessel.

717.—George Tomlinson Bousfield, of Loughborough Park, Brixton, for "*Improvements in apparatus for vaporizing hydrocarbon liquids for illuminating and heating.*" A communication. Patent dated March 14, 1865.

This invention relates to an apparatus for distributing the atmospheric air under the surface of the naphtha, so that vaporization may take place more quietly and uniformly than when the air is freed in a considerable body underneath the surface of the naphtha, and bubbling as the air rises through liquid is prevented. In connexion with the apparatus a bright metal condensing-plate is used for collecting the impurities and the drip from the regulator, so as to carry them back to the apparatus. When the atmospheric air is first admitted to the chamber containing the fluid, instant and powerful vaporization commences, which, if not properly checked, causes great pressure upon the burners; and as suddenly as it commences so suddenly does it subside to a certain, nearly equal pressure, or an unequal pressure or flow from the air-forcing apparatus will cause an unequal pressure and an unsteady flow of gas at the burner.

The second part of the invention is principally designed to overcome this sudden and undesirable or unequal flow of gas, and consists in placing a sponge or similar porous elastic substance in a chamber through which the gas must pass upwards in its passage from the vaporizing apparatus.

719.—Alfred Vincent Newton, of 66, Chancery Lane, London, mechanical draughtsman, for "*Improvements in securing low and uniform temperatures, applicable to public and private buildings, also to refrigerators, coolers, and condensers, and to ships and other vessels; and in the apparatus employed therein.*" A communication. Provisional protection only obtained. Dated March 14, 1865.

This invention consists in lowering and equalizing the temperature of the air in public and private buildings, so as to keep it as near as desirable at a mean temperature, by means of the cooling power of the earth at certain depths below its surface. In order to employ the low temperature which exists below the surface of the earth to cool the air in buildings, a current of water is first conducted to a proper distance below the earth's surface, and after it has been cooled, it is caused to ascend to the building to be cooled, or into a separate air-cooling chamber or refrigerator, from which it may be passed into the said building.

724.—Thomas Kennedy, of Kilmarnock, N.B., for "*Improvements in apparatus for smoke-vents or chimneys.*" Provisional protection only obtained. Dated March 15, 1865.

This invention consists in fitting smoke-vents or chimneys with apparatus of a permanent character. For this purpose a spindle with a pulley loose upon it is fixed in the top of the smoke-vent, and an endless chain is passed round the pulley long enough to reach the bottom, where, when not in use, it can be brought upon a hook. When required for sweeping or cleaning the chimney, a broom can be fixed to the chain and worked up and down.

727.—William Edward Newton, of 66, Chancery Lane, London, civil engineer, for "*Improvements in distilling oils and other liquids from coal and other substances.*" A communication. Patent dated March 15, 1865.

The first part of this invention relates to improvements in the retorts or stills in which such substances are to be treated; and the second part, to apparatus for condensing the vapours which are generated in retorts or stills for separating the uncondensed gases from the liquids. The bottom of the retort or still is made of an arched form, or of such form that its central part is the highest, in order that any liquids which are formed in the retort may be collected together. The bottom may, however, be inclined only in one direction if preferred. On each side of the retort, along its entire length, are channels, in which the oil and other liquids extracted from the charge without vaporization may be collected. These channels are inclined towards discharge-pipes, with which their lower ends connect, and into which they discharge whatever liquids are produced in the retort.

Under this part of the invention, the patentee claims the construction of the stills, or retorts, or distilling apparatus, as above described, whereby the operator is enabled to remove from the retort, and from the action of the fire, the oils and liquids, which may be set free from the charge at a lower temperature than is required to vaporize and drive over the same.

The principal feature of the second part of the invention consists of certain improvements in condensing apparatus, whereby the vapours of distillation are condensed in a more perfect manner than heretofore, and the oils separated in such a way as to prevent the escape of gaseous matter therewith. These improvements consist in the introduction between the retort or still and the usual condensing-worm of a large surface condenser, called the condensing-main, in which the refrigerating medium enters the apparatus centrally, and is then conducted downwards into the lower side of the outer chamber, and is delivered therefrom at the upper side. This construction not only effects the condensation rapidly, but also, by a proper arrangement of stop-cocks, allows of the flow of the water or other refrigerating medium used, being regulated to retard the condensation, or *vice versâ*, as the expediency of the work may demand.

731.—Hugh Smith, of No. 21, St. Stephen's Road, Westbourne Park, in the co. of Middlesex, for "*Improvements in gas-engines.*" Provisional protection only obtained. Dated March 15, 1865.

This invention has for its object improvements in gas-engines. In gas-engines as at present arranged, it is common to fire the charges of mixed gas and air by means of electricity; but this is inconvenient, as it is found difficult to keep the batteries constantly in working order.

According to this invention the charges are fired by means of vapour, which burns spontaneously on coming in contact with air. The vapour employed is that of the liquid phosphide of hydrogen. Small pipes called explosion-tubes are passed from the gas-main to each end of the cylinder, and on these tubes are applied, just before the connexion with the cylinder, bottles containing the liquid phosphide, so that the gas may pass over the liquid. When the cylinder is charged with gas and air a tap on one of the explosion-tubes is opened, and the gas, carrying with it the vapour of the phosphide, enters the cylinder, and the vapour then meeting with the air an explosion takes place, driving the piston along the cylinder; and in this manner the piston is driven from end to end of the cylinder. This method of firing the charges is applicable whatever be the form of the combustion-chamber—whether it be as assumed in the foregoing description, a cylinder with a piston working within it, or of other form and construction.

751.—Jacob Goodfellow, of Blackburn, engineer, for "*Improved combinations of direct-acting steam-engines with single or double acting pumps, for pumping water, air, or gases.*" Provisional protection only obtained. Dated March 17, 1865.

This invention consists in the employment of direct-acting steam-engines, working horizontally, vertically, or diagonally, and connecting them direct to single or double acting pumps, thereby dispensing with the ordinary crank-shafts, cranks, connecting-rods, and eccentrics; and these improved arrangements are applicable to pumps for fire-engines, for feeding boilers, bilge-pumps, blowers, and all other purposes where pumps are required.

754.—William Roberts, of Millwall, engineer, for "*Improvements in cocks or valves.*" Provisional protection only obtained. Dated March 17, 1865.

This invention has for its object improvements in cocks or valves, and is applicable to cocks or valves, such as are described in the specification of a patent granted to the present inventor and T. Greenacre, 22nd May, 1862 (No. 1551), and to other cocks or valves in which a number of complete rotations of a lever or handle is required to open the valve. In using such cocks or valves difficulty is often experienced in ascertaining to what extent the water-way or passage is open. To obviate this inconvenience there is combined with the cock or valve an index mounted on an axis, and this axis is geared with the spindle in such a manner that the index axis makes somewhat less than a complete revolution, whilst the lever or handle by means of which the valve is turned, is turned the number of times required to move the valve from end to end of its course. The arc over which the index travels is marked at each end, at the points where the index stands when the passage is shut, and where it stands when it is full open; the arc may also be further graduated if desired. The gearing employed is a bevelled wheel on the spindle actuating a bevelled wheel on an intermediate axis on which a worm is formed, and this gears with a toothed wheel on the axis of the index.

781.—Charles Hill Pennycook, of Glasgow, gas engineer, for "*Improvements in constructing gasometers, tanks, casks, and similar vessels.*" Provisional protection only obtained. Dated March 21, 1865.

This invention has for its object the construction of gasometers, tanks, casks and similar vessels in a simplified and improved manner, and more economically than heretofore.

In constructing a gasometer, for example, according to this invention, instead of attaching to each other the metallic cheeks or plates forming the shell by riveting the same continually round their adjacent edges, such sheets are connected together by narrow intervening seam strips formed with grooves on each side, into which grooves the edges of the sheets are entered. At the meeting corners lapping pieces are riveted to the adjacent sheets to bind them to each other, whilst the grooves are made tight by paint, cement, or solder. At the bottom edge the frame-ring may be formed with a groove to receive the bottom edges of the lowest line of sheets, whilst at the angle between the sides and the roof the frame-ring may be formed with grooves in suitable positions for the side sheets below and the roof sheets above; or a narrow grooved seam strip may be used at the angle, and a frame-ring in addition. In making gasometer and other tanks, the same general construction may be adopted, but in the place of some of the vertical seam strips, frame pillars will be required to give strength, such pillars being formed with grooves to receive the edges of the adjacent sheets or plates. A ring grooved on its under side and fitted upon the pillars and sheets at the top edge of the tank will bind the whole together. Casks and similar smaller vessels may be rapidly and economically put together in a similar way.

In some cases a single sheet will serve for the cylindrical part, and its two meeting edges will be entered into the grooves of a longitudinal seam strip, whilst its end edges will be entered into grooved rings.

791.—James Smith, of Berkley House, Seaforth, near Liverpool, and Sidney Arthur Chease, of Egremont, for "*An improved arrangement of valves and other appliances for a new description of hydraulic engine for raising water and other fluids above their common level, the fluid so raised to be used as a motive power.*" Patent dated March 21, 1865.

This invention is applicable to a hydraulic engine for raising water and other fluids above their common level, for which the present patentees obtained letters patent dated 9th July, 1863 (No. 170)6, and consists in constructing a reservoir having upper and lower compartments. The upper compartment has a lift-pump for raising the water or other fluid from the lower compartment, producing two different levels of the fluid in the one reservoir. Into the lower level of the fluid is inserted a portion of a tank or tanks, allowing the fluid in them to have free play around them. Inside and on the bottom of the tank or tanks is fixed a box or boxes, each having two sets of valves composed of gun metal, one set opening to the fluid contained in the reservoir. These valves are so arranged that when the pair or set of valves in communication with the tank are open, the other pair or set of valves are closed and shut off the communication with the reservoir, and *vice versâ*. On the upper side of the box or boxes is a circular aperture, round which is fitted a cup leather valve. This valve fits the lower part of an air-tight cylinder or float, which is inserted in the circular aperture; and, by means of connecting valves, the cylinder or float is attached to the end of a lever or beam. The other end of the beam is united by two connecting-rods to the crank of the engine and the piston-rod of the lift-pump. On the shaft is fixed an eccentric to work the gear which actuates the tank valves. On the head of the tank is fixed a feed-pipe, which passes downwards into the upper compartment of the reservoir, having a valve attached to it which is always kept beneath the high level of the fluid in the upper compartment of the reservoir, and thus acts as a syphon; the tank and feed-pipe are then filled with water or some other fluid, and raised in the lower compartment of the reservoir to within a few inches of the lid of the tank or tanks when the engine is ready for use.

796.—William Mattieu Williams, of the Celyn Caergwrle, near Wrexham, manufacturer, for "*Improvements in apparatus for the distillation of coal and peat, and such other substances as are or may be used for the manufacture of solid and liquid volatile hydrocarbons, or for the manufacture of the said hydrocarbons and coke.*" Patent dated March 22, 1865.

The distillatory apparatus, constructed in accordance with this invention, consists of retorts made of cast or, by preference, wrought iron, in the figure of an oblong box, open at one or both ends, the sides being a little convex to give strength, and to diminish the liability to crack by the action of the fire. The door is fitted to one end of the retort, and is of the full dimensions thereof. The outlet channel for carrying away the products of distillation is situated at the other end, and passes downwards, so as rapidly to convey the vapours from the influence of the heat, and such channel may be made separate from the retort and attached thereto.

The heat is applied to the underside of the door end of the retorts passing to a flue running the whole length of the retort, or as nearly so as practicable, and nearly, or quite, as wide as the retort. This flue communicates with other flues, placed as far back as possible, to carry the heat upwards to another flue running along the top of the retort. At the fire-place end of this flue the chimney is situated.

The retort is charged by a tray, or lining made of wrought iron, of the shape and rather shorter than the retort, which tray or lining is divided into three compartments, by means of two shelves. The upper and lower compartments are closed at one end. The bottom of the top compartment is of open bars and perforated metal; the top of the lower compartment is also open. The coal or substance to be distilled is placed in the top and bottom compartments, in order that they may be near to the heated surfaces of the top and bottom of the retort, and that the vapour may have a ready exit through the middle open space of the retort lining or chamber, which is the least heated.

809.—William Morrant, baker, of 6, Furnival's Inn, London, for "*Improvements in Argand gas-burners.*" Patent dated March 22, 1865.

Heretofore the quantity of air passing through Argand burners to the interior of the flame has been constant, whether the supply of gas to and through the burner is full on, or up to the maximum or not. It has been ascertained that if the air passage be suitable for supplying air through the burner when the maximum supply of gas is being consumed by the burner, then that the supply of air through the tube of the burner will be in excess of the requirement when less gas is being burned.

This invention consists in applying a movable valve or regulator to an Argand gas-burner below its upper surface where the gas is ignited, so that the supply of air through the Argand burner to the interior of the flame may be regulated from time to time, according to the quantity of gas which is allowed to pass, and is being burnt by the burner. By such means gas will be burned with great economy, and more light will be obtained when burning gas by an Argand burner than has heretofore been the case.

The form of the valve regulator and the manner of adjusting the same may be greatly varied, but a valve or regulator is preferred which will admit of being moved by a screw, and be thereby held in the desired position for allowing the required quantity of air to pass through the gas-burner. The position of the valve may be varied so long as it is below the upper surface of the burner.

APPLICATIONS FOR LETTERS PATENT.

3272.—John Wright Carr, of Newland Hall, Roxwell, Essex, for "*Producing and applying rotating motion by means of an apparatus to be worked by fluids, steam, compressed air, or by water, or by gas.*" Dec. 19, 1865.

3285.—John Gibbon, manager of the Canneline Oil-Works, Tryddyn, Flintshire, for "*An improved retort for distilling or extracting products from cannel coal, shale, or schist, and more especially from the small coal or dust technically known as 'slack.'*" Dec. 20, 1865.

3287.—Joseph John Harrison, of Broughton, Lancashire, C.E., and Edward Harrison, of Balham Hill, Surrey, gentleman, for "*An improved mode of and apparatus for purifying and deodorizing impure air, whether in buildings, ships, mines, or sewers, which improvement is also applicable for ventilating purposes.*" Dec. 20, 1865.

3292.—William Clark, of 53, Chancery Lane, London, engineer, for "*A new and improved apparatus for cooling and purifying air in rooms or compartments, and ventilating the same.*" A communication. Dec. 20, 1865.

3296.—John Watson, of Kildale, Cleveland, Yorkshire, and Lombard House, George Yard, Lombard Street, London, and John Player, of Norton, Stockton-on-Tees, Durham, engineer, for "*Improvements in obtaining oil and other products from bituminous shale.*" Dec. 20, 1865.

3303.—George Davies, of 1, Serle Street, Lincoln's Inn, London, and 87, St. Vincent Street, Glasgow, C.E., for "*An improved gas-burner.*" A communication. Dec. 21, 1865.

3315.—William Jackson, of Lancaster, Lancashire, engineer, for "*Improvements in pumps.*" Dec. 22, 1865.

3317.—George Davies, of 1, Serle Street, Lincoln's Inn, London, C.E., for "*Improved apparatus for burning combustible vapour (such as that from naphtha or coal oil) for heating, cooking, and lighting purposes.*" A communication. Dec. 22, 1865.

3330.—Henry Davis Hoskold, of Cinderford, Gloucestershire, mining engineer, and William Blanch Brain, of Forest of Dean, Gloucestershire, mining engineer, for "*Improvements in pumps.*" Dec. 23, 1865.

3333.—Charles Woodward Moore, of 12 and 13, Little Earl Street, Soho, London, for "*Improvements in cocks or valves.*" A communication. Dec. 23, 1865.

3345.—James Young, jun., of Limefield, Mid Lothian, North Britain, gentleman, for "*Improvements in treating hydrocarbon oils.*" Dec. 27, 1865.

15.—Richard Archibald Brooman, of 166, Fleet Street, London, for "*An improved extensible apparatus for the passage of gases and fluids, especially adapted for gaseliers.*" A communication. Jan. 2, 1866.

23.—George Starbuck, of Birkenhead, Chester, oil merchant, and John Carrington Sellars, of the same place, manufacturing chemist, for "*Improvements in cement for making good the joints in oil-stills and retorts and joints exposed to medium or high temperatures.*" Jan. 3, 1866.

GRANTS OF PROVISIONAL PROTECTION.

2710.—Richard Fell, of 7, Robinson Row, Middlesex, engineer, and Davy Hammond, of Hackney Road, London, for "*An improved apparatus for regulating the supply of water to tanks, water-butts, or cisterns; applicable also to other purposes.*" Oct. 20, 1865.

2912.—Peter Ellis, of 9, Orange Court, Liverpool, Lancashire, architect for "*An improved description of water-closet.*" Nov. 13, 1865.

3088.—Longdon M'Murdo Rogers, of Bouverie Street, London, merchant, for "*Improved means of preventing water-pipes from bursting.*" A communication. Dec. 1, 1865.

3214.—Alfred Vincent Newton, of 66, Chancery Lane, London, mechanical draughtsman, for "*An improved construction of tool for cutting tubes.*" A communication. Dec. 12, 1865.

3261.—Samuel Whitehouse, the elder, Samuel Whitehouse, the younger, Jeremiah Whitehouse, and William Whitehouse, all of Dudley, Worcestershire, engineers, for "*Certain improvements in the means of collecting waste gases arising from blast-furnaces.*" Dec. 18, 1865.

3264.—Joseph Harcourt, of Birmingham, Warwickshire, lacquer manufacturer, for "*A new process of lacquering and finishing metal goods, such as gas-fittings and other like articles, usually finished by bronzing and lacquering.*" Dec. 18, 1865.

3285.—John Gibbon, manager of the Canneline Oil-Works, Tryddyn, Flintshire, for "*An improved retort for distilling or extracting products from cannel coal, shale, or schist, and more especially from the small coal or dust technically known as 'slack.'*" Dec. 20, 1865.

3287.—Joseph John Harrison, of Broughton, Lancashire, C.E., and Edward Harrison, of Balham Hill, Surrey, gentleman, for "*An improved mode of and apparatus for purifying and deodorizing impure air, whether in buildings, ships, mines, or sewers, which improvement is also applicable for ventilating purposes.*" Dec. 20, 1865.

3296.—John Watson, of Kildale, Cleveland, Yorkshire, and Lombard House, George Yard, Lombard Street, and John Player, of Norton, Stockton-on-Tees, Durham, engineer, for "*Improvements in obtaining oil and other products from bituminous shale.*" Dec. 20, 1865.

3315.—William Jackson, of Lancaster, Lancashire, engineer, for "*Improvements in pumps.*" Dec. 22, 1865.

3317.—George Davies, of 1, Serle Street, Lincoln's Inn, London, civil engineer, for "*Improved apparatus for burning combustible vapour (such as that from naphtha or coal oil) for heating, cooking, and lighting purposes.*" A communication. Dec. 22, 1865.

3333.—Charles Woodward Moore, of 12 and 13, Little Earl Street, Soho, Middlesex, for "*Improvements in cocks or valves.*" A communication. Dec. 23, 1865.

NOTICES TO PROCEED.

2167.—John Newton, of Preston, Lancashire, C.E., for "*An improved gully or stench-trap, for the prevention of the escape of noxious effluvia from drains or sewers, and for preventing the ingress of sand or other solid matters into the same.*" Aug. 23, 1865.

2191.—John Moule, manufacturing chemist, of 391, Hackney Road, London, for "*An improvement in the treatment of tar, and other substances suitable to be used in the manufacture of paint, and for other purposes.*" Aug. 25, 1865.

2199.—Robert Gordon Rattray, of Aberdeen, M.D., for "*Improvements in apparatus for supplying regulated or measured quantities of water.*" Aug. 26, 1865.

2220.—William Henry Gummer, of Rotherham, Yorkshire, for "*An improved stench-trap and sink-pipe protector.*" Aug. 29, 1865.

2465.—Alfred Vincent Newton, of 66, Chancery Lane, London, mechanical draughtsman, for "*An improved mode of decarbonizing retorts.*" A communication. Sept. 26, 1865.

2674.—Carl Gustav Lenk, of Dresden, Saxony, now residing at 6, Lawrence Lane, Cheapside, London, machinist, for "*An improved process for purifying and preserving water.*" Oct. 17, 1865.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

3334.—Samuel Fox, "*Improvements in retorts and apparatus employed for the manufacture of gas, and also in purifying gas.*" Dec. 12, 1862.

3353.—John M'Inness and Elijah Freeman Prentiss, "*Improvements in the distillation and treatment of petroleum and other like oils to obtain products therefrom, and in the apparatus to be used therefor, parts of which can be applied for distilling other liquids.*" Dec. 16, 1862.

3372.—John Ramsbottom and George Hacking, "*Improvements in machinery or apparatus for measuring and registering the flow of water and other fluids.*" Dec. 17, 1862.

3427.—George Haseltine, "*Improvements in the mode of and apparatus for converting petroleum or coal oil into gas for lighting and heating, the said improvements being especially applicable to lamps and stoves.*" A communication. Dec. 23, 1862.

3462.—Joseph Hadley Riddell, "*Improvements in cast metal or other pipes or tubes for conveying gases, fluids, or vapours, and in the mode of connecting such pipes or tubes.*" Dec. 29, 1862.

3465.—Frederick Tolhausen, "*The use of petroleum or coal oil as fuel, and also for the machinery and apparatus to be employed for this purpose.*" A communication. Dec. 29, 1862.

Parliamentary Intelligence.

METROPOLIS GAS ACT AMENDMENT BILL.

A Bill to amend the "Metropolis Gas Act, 1860," and the several Acts of the Companies, for supplying the Metropolitan Districts or the City of London with Gas, and to enable the Metropolitan Board of Works, or the Vestries, District, or Parochial Boards in combination of any District, or the City of London, to purchase the Gas-Works, Mains, Pipes, Machinery, and Powers of all or any one, or more of such Companies; to levy rates, and for other purposes.

[*The words printed in* Italics *are proposed to be inserted in committee.*]

Whereas by an Act passed in the twenty-third and twenty-fourth years of the reign of her present Majesty the Queen, intituled "An Act for better regulating the supply of Gas to the Metropolis," the following Ga Companies (that is to say), The Gaslight and Coke Company.—The City of London Gaslight and Coke Company.—The Commercial Gaslight and Coke Company.—The Equitable Gaslight Company.—The Great Central Gas Consumers Company.—The Independent Gaslight and Coke Company.—The London Gaslight Company.—The Phœnix Gaslight and Coke Company.—The Ratcliff Gaslight and Coke Company.—The Surrey Consumers Gas Company.—The South Metropolitan Gaslight and Coke Company.—The Western Gaslight Company, (Limited), and the Imperial Gaslight and Coke Company, were respectively limited to the several districts supplied by each of them with gas, as the same are defined upon four duplicate maps, signed by the Right Honourable Thomas Henry Sutton Sotheron Estcourt, which maps have been severally deposited with the respective clerks of the peace, for the counties of Middlesex, London, Surrey, and Kent. And the regulations to which those companies were subject were rendered uniform.

And whereas by an Act passed in the twenty-first and twenty-second years, amended by an Act passed in the twenty-eighth year of the reign of her present Majesty the Queen, the Crystal Palace District Gas Company, were incorporated, and were authorized to supply with gas the district defined by their said special Act.

And whereas by an Act passed in the eighteenth year, and amended by an Act passed in the twenty-fifth year of her present Majesty, the "Woolwich, Plumstead, and Charlton Consumers Gas Company," were incorporated, and were authorized to supply with gas the district defined by their said special Act.

And whereas by an Act passed in the nineteenth and twentieth years of the reign of her present Majesty the Queen, the Wandsworth and Putney Gaslight and Coke Company, were incorporated, and were authorized to supply with gas the district defined by their said special Act.

And whereas the said three last-named companies are not affected by the provisions of the "Metropolis Gas Act, 1860," except only so far as the said companies or any of them, shall supply gas in parts of the metropolis, other than those defined by their respective special Acts.

And whereas it is expedient that further provision be made for the due regulation of the above-named companies and persons supplying gas and for the further and better supply of gas within and adjacent to the metropolis. And whereas the objects of this Act cannot be carried into effect without the authority of Parliament.

May it therefore please your Majesty,

That it may be enacted, and be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows (that is to say):

Short Title.

1. This Act may for all purposes be cited as "Metropolis Gas Act Amendment Act, 1866."

8 Vict. cap. 18, 23 & 24 Vict. cap. 106 incorporated with Act.

2. The Lands Clauses Consolidation Act, 1845, and the Lands Clauses Consolidation Acts Amendment Act, 1860, are (except where the provisions thereof are inconsistent with this Act) incorporated with this Act.

Companies and Persons to whom Act applies.

3. This Act applies to the said several before named gas companies, and to all gas companies, and persons already or hereafter supplying gas within the limits of the metropolis (as defined by the Act of the eighteenth and nineteenth years of her present Majesty, chapter 120, for the local management of the metropolis), and the City of London.

Interpretation of Terms.

4. In the construction of this Act, the following words and expressions have the following meanings, unless excluded by the subject or context, that is to say:

The expression "gas company," or "gas companies," means and includes any or either, or all of the before-named companies, including the Crystal Palace District Gas Company, the Woolwich, Plumstead, and Charlton Consumers Gas Company, and the Wandsworth and Putney Gaslight and Coke Company, and any, and every company, and any person or persons supplying gas within the limits of the metropolis aforesaid, and the City of London.

The expression "district lighting board" includes the vestries and district, and other parochial boards, in combination for the purposes of this Act, of each metropolitan district, as defined by "The Metropolis Gas Act, 1860," and the City of London.

Construction of certain Terms in 10 & 11 Vic. cap. 15.

5. In construing "The Gas-Works Clauses Act," as incorporated with this Act, the expression the "Special Act," shall mean this Act, and the expression "The Works," or "The Undertaking" shall mean the gas-works and works connected therewith, of any, or either, or all of the said gas companies, and the power to purchase, which is by this Act vested in the Metropolitan Board of Works, and district lighting board, shall include any gas-works which they, or either of them may construct under the powers of this Act, unless in any of the cases aforesaid, there be something in the subject or context, repugnant to such construction.

Limiting Charge for Supply of Gas by Meter.

6. The maximum price at which gas shall be sold by the said gas companies, or any or either of them, or by the said Metropolitan Board of Works, or district lighting board, under the powers by this Act vested in them, and each of them, shall not exceed the sum of *four* shillings and *three* pence per thousand cubic feet, for cannel gas, and the sum of *three* shillings and *six* pence per thousand cubic feet for common gas, provided that when the profits derived from the "works" or "undertakings" of any or either of the said gas companies, shall, in any years exceed the sum of *five* pounds per centum per annum, on the capital invested therein, exclusive of the reserve-fund, then the price to be charged for gas shall be reduced, in proportion to such excess of profits beyond *five* pounds per centum per annum.

Power to Metropolitan Board of Works to Purchase Gas-Works.

7. The said Metropolitan Board of Works shall have power at any time to buy up and purchase, either compulsorily or by agreement, the "works" and "undertaking," of all or any, or either of the said gas companies, or of any other gas company, or gas companies, or person or persons, and the lands, sites, stations, mains, pipes, plant and apparatus connected therewith, and used in and for the manufacture, storing, and supply of gas to the said metropolitan districts, the City of London, or any part thereof.

Formation of District Lighting Board.

8. The vestries and district, and other parochial boards, of each or any metropolitan district, as defined by "The Metropolis Gas Act, 1860," or of the City of London, or the majority of them, representing not less than *three-fourths* of the rateable value of such district or the City of London are authorized to combine, and may combine together for the purposes of this Act, and form a general board under the title or designation of "The District Lighting Board," and such board shall in the aggregate possess, hold, and exercise the powers and privileges of each and every, and all of the vestry and district, and other parochial boards, included in such district or in the City of London.

Power to District Lighting Board to Purchase Gas-Works.

9. The said district lighting board shall have power at any time, but without prejudice to the right of the said Metropolitan Board of Works, to buy up and purchase either compulsorily or by agreement, the "works" and "undertaking" of the gas company, or gas companies supplying the inhabitants of such district with gas, and the lands, sites, mains, pipes, and apparatus connected therewith, and used in the manufacture, storing, and supply of gas to the said district.

Sale of Gas-Works to Metropolitan Board of Works or District Lighting Board.

10. The gas company whose "works" and "undertaking," it shall be so intended to purchase and buy up, shall sell and convey to the said Metropolitan Board of Works, or district lighting board, as the case may be, who accordingly shall purchase and take the "works" and "undertaking" of such gas company, and the lands, sites, mains, pipes, plant, and apparatus connected therewith, and used in the manufacture, storing, and supply of gas, for such consideration, if the purchase and sale shall be by agreement, to be paid at such time, in such manner, and generally upon such terms as shall have been agreed upon between the said gas company, and the said Metropolitan Board of Works, or district lighting board, as the case may be. And in the case of such sale being compulsory, then for and upon such terms and conditions as shall be fixed, and such consideration as shall be determined by the *Board of Trade*, to whom the matter shall be referred for arbitration, and the said *Board of Trade* shall take as the basis of their decision the current market value of the shares on the *first* day of *January*, one thousand eight hundred and sixty-*six* and shall provide for the payment of debentures and compensation to the officers of the gas company whose undertaking it shall be intended to purchase, and the decision of the said *Board of Trade* shall for the purposes of this Act be final and conclusive. And the receipt of any *three* of the committee of management or directors of the said gas company for the purchase-money for the "works" and "undertaking" shall be a sufficient discharge for the same. And neither the said Metropolitan Board of Works, nor the said district lighting board shall be bound to see to the application of such purchase-money, or be answerable for its misapplication or non-application.

Upon execution of Conveyance the Gas Undertaking shall vest in the Metropolitan Board of Works, or District Lighting Board.

11. Immediately upon the execution by the gas company, whose "works" and "undertaking" shall be so purchased and bought up of a deed of conveyance under their common seal of their "works" and "undertaking," to the said Metropolitan Board of Works or district lighting board, in which deed the consideration money shall be fully and truly stated, and which deed shall be duly stamped for denoting the full and proper stamp duty in respect of such consideration, the "works" and "undertaking" thereby conveyed shall by virtue of such deed and of this Act become actually vested in the said Metropolitan Board of Works or district lighting board for all the estate and interest of the said gas company therein at the date of such conveyance. And thereafter the said Metropolitan Board of Works or district lighting board shall, for the purpose of making and maintaining gas-works and manufacturing and supplying

gas and all matters incident thereto, have the like powers as the gas company would have had.

Power to Manufacture Gas, or to Contract for Use of Works and Supply.

12. The said Metropolitan Board of Works or district lighting board immediately upon the "works" and "undertaking" of any gas company being vested in them, as lastly hereinbefore provided, may themselves manufacture and supply gas, or enter into a contract or contracts with any company or companies, or person or persons, to use such "works," and the lands, sites, stations, mains, pipes, plant, and apparatus connected therewith for the purpose of manufacturing, storing, and supplying gas (in case the "undertaking" or "undertakings" shall be vested in the said Metropolitan Board of Works) to the metropolis and the City of London or any part thereof, and (in case the "undertaking" or "undertakings" shall be vested in any district lighting board) to the district, heretofore supplied by the gas company or gas companies whose "works" and "undertaking" shall have been so purchased and bought up. And may sell and dispose of the coke and other residuum arising from the materials used in the manufacture of gas, to such persons and in such manner as the said Metropolitan Board of Works or district lighting board may think proper.

Power to Borrow Money and to Levy Rates.

13. The said Metropolitan Board of Works, or the district lighting board, shall have power for the purposes of this Act to raise or borrow money by mortgage, or upon bonds or debentures, and shall provide for the payment of the money so borrowed with interest in the meantime, not exceeding the sum of *five* pounds per centum per annum, by making, levying, and collecting rates, dues, duties and charges, uniform or otherwise, at one time or at several times as they shall think proper, upon the property and inhabitants in the district or districts of the metropolis or of the City of London, supplied by the gas company or gas companies, whose works and undertaking it may be so intended to purchase and buy up. And the money so borrowed, with the interest thereon, shall be considered to be raised on the security of such rates, dues, duties, and charges; and such rates, dues, duties, and charges, shall be made, levied, and collected by the said Metropolitan Board of Works, or the vestries and district boards of any district lighting board, by virtue of this Act and of the powers of borrowing and making and levying rates, dues, duties, and charges, vested in them by the Metropolis Local Management Acts.

Application of Borrowed Money—Limitation of Liability of each District.

14. The money so raised and borrowed by the said Metropolitan Board of Works or district lighting board, under the powers herein contained, shall be paid and applied in and towards the purchase of the "works" and "undertaking" or "undertakings" of the gas company or gas companies so intended to be purchased and bought up, and the rates, dues, duties, and charges, shall be so levied and collected for payment of the money so borrowed, that the property and inhabitants of one of the said metropolitan districts, or the City of London, shall not be liable to or chargeable with the payment of any portion of the purchase-money, for the lands, sites, stations, mains, pipes, plant, and apparatus of the gas company, or gas companies, supplying with gas the City of London or the others of the said metropolitan districts or any one or more of them.

Power to Sell Gas-Works.

15. The said Metropolitan Board of Works, or district lighting board, after having purchased the lands, sites, works, stations, mains, pipes, and apparatus of any one or more of the said gas companies shall have power and are by this Act authorized in their discretion, to sell and dispose of the whole of such gas-works, or any part or portion thereof, by public auction or private contract, at one time or at several times—for such sum or sums of money as may be reasonably obtained for the same, and subject to such conditions of sale as they shall think proper, and shall use and apply the proceeds of such sale or sales in and towards the purchase hereinafter authorized to be made of other lands and sites.

Power to Purchase other Lands and Sites.

16. The said Metropolitan Board of Works or district lighting board shall have power to purchase, either compulsorily or by agreement, other lands and sites in the suburbs and the vicinity of the metropolis, such lands and sites so to be purchased not to be situate within a radius or distance of *five* miles from Charing Cross.

Power to Build other Gas-Works.

17. The said Metropolitan Board of Works or district lighting board shall, upon such lands and sites when so purchased, erect and build, or enter into any contract or contracts for the erection and building of other gas-works, furnaces, retorts, meters, meter-houses, gasholders, and plant, with all requisite buildings, apparatus, and conveniences, for the manufacture and storing, and supplying of gas, and to connect such works with the mains and pipes already laid down in the district or districts of the City of London, intended to be supplied or to lay down other mains and pipes as the said Metropolitan Board of Works or district lighting board may or shall think proper, and shall have power to pass pipes of supply through the lands or streets of any other district or districts.

Power to Open Streets without Notice.

18. The said Metropolitan Board of Works or district lighting board, shall for the purposes of this Act have and be vested with power at any time to open or break up any street, bridge, sewer, drain, or tunnel, and it shall not be necessary for them to give any notice of their intention so to do.

No Gas-Works to be Built within Five *Miles from Charing Cross.*

19. After the passing of this Act no gas-works shall be erected by any company or companies, or person or persons, within the said radius or distance of *five* miles from Charing Cross.

Limit of Charge for Gas—Determination of Existing Contracts.

20. After the *thirty-first* day of *December* one thousand eight hundred and sixty *six*, no gas company shall, except under existing contracts, demand or take for gas supplied by them any sum of money exceeding the rate by this Act authorized, and all contracts made or existing before the *thirty-first* day of *December*, one thousand eight hundred and sixty *six*, between any of the gas companies included in this Act, and any local authority for, or relating to, the supply of gas, shall terminate on the *twenty-fifth* day of *March*, one thousand eight hundred and sixty *seven*, and thereafter the provisions of this Act in all particulars shall apply to such company.

Actions, &c., not to Abate and Penalties to be Recoverable.

21. No action, prosecution, or other proceedings whatsoever commenced or liable to be commenced, either by or against the gas company or gas companies, whose works and undertaking may be so purchased and bought up, shall abate or be discontinued, or prejudicially affected by this Act, or by such transfer as aforesaid: but the same shall continue and take effect, either in favour of or against the said gas company or gas companies, in the same manner in all respects, as the same would have continued and taken effect in relation to the said gas company or gas companies, if this Act had not been passed; and all penalties incurred, by reason of any offence against the provisions of their several Acts, or Articles of Association, prior to the passing of this Act, may be sued for, and all offences committed before the passing of this Act against the provisions aforesaid, may be prosecuted in such or the like manner to all intents and purposes, as such penalties might have been sued for, or such offences prosecuted if this Act had not been passed.

Upon Works vesting in the Metropolitan Board or District Lighting Board Powers of Gas Company to cease.

22. Immediately on the "undertaking" of any or either of the said gas companies becoming vested in the said Metropolitan Board of Works, or district lighting board, all the powers of such gas company or gas companies to supply gas within the district or the City of London shall cease.

As to Recovery of Gas-Rent under Twenty *Pounds.*

23. In addition to the powers given by the "Gas-Works Clauses Act, 1847," in this behalf, the said Metropolitan Board of Works or district lighting board, may recover any rent or sums due to them for gas supply, or for any meter, or fittings supplied or let by them, together with the expenses of cutting off their service-pipe or gas, and the costs of recovering such rent or sums, although the amount of such rent or sums and costs be less than *twenty* pounds in any county court, or other court having jurisdiction for the recovery of debts under *twenty* pounds.

Application of Purchase-Money for Gas Undertaking.

24. The committee of management or directors for the time being of the gas company, whose "works" and "undertaking" shall be purchased and bought up, shall stand possessed of the money which shall be paid by the said Metropolitan Board of Works or district lighting board, for the purchase of the "undertaking," and of all other monies for the time being belonging to the said gas company upon trust to pay thereout all debts and pecuniary liabilities of the said gas company, which shall then have been incurred and remain unpaid, and to divide and distribute the residue between the several persons who shall be holders of the shares in the said gas company, their respective executors, administrators, or assigns, rateably and in proportion to the number of their respective shares in the capital of the said gas company. The several persons whose names shall appear in the books of the said gas company, as being the proprietors of shares therein, shall, unless the contrary be proved to the satisfaction of the committee of management or directors of the said gas company be considered to be shareholders of such gas company for the purposes of the distribution of the purchase-money for the "undertaking," and of the other monies for the time being belonging to the said gas company.

Receipt of Executors, &c., of Shareholders to Discharge Company.

25. The receipt of any executor, administrator, assignee, committee, or guardian of any shareholder in the gas company, whose works and undertaking shall be purchased and bought up, shall be an effectual discharge to the said gas company, and to the committee of management or directors thereof, for so much of the purchase-money or other monies, as in such receipt shall be expressed to be received, and shall exonerate them from any trust or obligation affecting the shares in respect of which such money shall be paid.

Provision in Case of Absence of Shareholders.

26. If the gas company whose works and undertaking shall be purchased and bought up, be unable, by reason of the absence from Great Britain or incapacity of any shareholder, his executors, administrators, or assigns, or of his existance or place of abode not being after diligent inquiry ascertainable by the said gas company, the said gas company from time to time shall, according to the provisions of any Act of Parliament for the time being in force authorizing the payment into the Court of Chancery of trust monies under like circumstances, pay into that court all monies which according to this Act ought to be paid by the said gas company to him or them, and such payment shall be deemed as payment by the said gas company to him or them, and he or they shall be entitled to obtain, according to the provisions of any such Act, payment of such money out of that court to him or them.

Expenses of Act.

27. The costs, charges, and expenses, of and incident to the preparing and applying for, obtaining and passing of this Act, and preliminary thereto, shall be paid by the Metropolitan Board of Works out of such funds as may be and shall be levied by their authority from the several vestries and district boards in proportion to their annual rateable value, and such amount shall be included in the precept of the said Metropolitan Board of Works, under the authority of the Metropolis Local Management Acts.

Miscellaneous News.

PARÀ GAS COMPANY, LIMITED.

The Ordinary General Meeting of this Company was held on Friday, Dec. 29, at the Offices, 3, Victoria Street—Sir WILLIAM CLAY, Bart., in the chair.

Mr. GREEN (the secretary) read the following report:—

The directors, in meeting the shareholders, have much pleasure in having it in their power to report very favourably of the state, condition, and prospects of the company. Appended to their report is a statement of accounts to September, 1865.

Mr. Wilson, the company's manager at Parà, has had to contend, in the commencement of his operations, with the disadvantage of a most severe financial crisis in the commercial towns of Brazil, followed by the breaking out of the war with Paraguay.

These events have absorbed the attention of the Government and the inhabitants, and at the same time, diverted any surplus revenue to the purposes of war.

It is owing to these unfavourable circumstances that the company has not yet received the promised order from the Government for lighting the additional street lamps. Mr. Wilson, however, writes that he has no doubt that as soon as the war is ended the additional lamps will be put up, or possibly before, as the desire for more street lights on the part of the public has been very strongly expressed to the Government.

The causes referred to also retarded the extension of private lights in the earlier part of the present year, but with the revival of trade in the month of July, the increase of meters in private residences recommenced. Between that date and the end of September 80 were fixed, bringing the total number up to 277, and private lights to the number of 1406. Subsequent accounts exhibit the same rate of increased consumption.

The consumption of gas in the last week of August was	.	406,500	cub. feet.
" " September.	.	452,700	"
" " October	.	459,800	"
Increase of weekly consumption		53,300	cub. feet.

The directors are happy to announce to you that they have finally closed the construction account with Messrs. Peto and Betts, and Aird and Sons, and wound up the accounts with those gentlemen. In this settlement is included the purchase of some of the plant and machinery belonging to the contractors, selected by Mr. Wilson as advantageous for the company to possess.

It is gratifying to your directors to be enabled to state that the manager is on very friendly terms with the authorities at Parà. After much negotiation he has

succeeded in obtaining from the Government the remission of duties upon the gas-fittings supplied to the public by the company.

Your directors had made an arrangement with Messrs. Lambert and Son for the necessary supply of gas-fittings and the forwarding a staff of skilled fitters to Parà.

In virtue of this arrangement these gentlemen shipped a considerable supply of fittings, and sent out an experienced manager and staff of workmen for this service. Messrs. Lambert have since made a proposition to the directors to take over this stock at cost price, and as it was found that in consequence of their having to keep up a highly-paid manager and staff they were compelled to charge a high rate for the fittings, the directors have accepted the proposal. They have accordingly taken upon themselves to supply the services and general fittings to the houses.

This change in the gas-fitting department has already led to a marked increase in the number of the company's tenants. The entire charge of this business is now under the superintendence of Mr. Wilson.

The attention of the directors was early drawn to the great importance of creating a sale for the residual products, and they are glad to say that the means adopted to create a coke trade have been successful, as will be seen by the accounts, but with regard to tar there has been but a limited sale. The directors, therefore, authorized the construction of apparatus for distilling it into naphtha, which is in demand at a good price. This is now in full work.

The foregoing statement will have partly prepared you to appreciate the motives of the directors for proposing an increase of the capital of the company, an intention which, in accordance with a provision in the Articles of Association, was announced in the notice convening this meeting. The capital, £100,000, was perhaps originally fixed somewhat too low. The works, which are admirably constructed, were executed for the stipulated price, and no circumstance occurred to enhance their cost, yet when all was completed, including some extra work found to be necessary or advantageous, the purchase of some of the contractors stock, all engineering expenses, and some few incidental disbursements, the origital capital was found to be exhausted.

The success of the undertaking has been greater than your directors had ventured to anticipate, and the increase of revenue has been most satisfactory.

In the report laid before you in December last, the revenue for the then current year—that is from the 30th of September, 1864, to the 30th of September of the present year—was estimated at from £10,000 to £12,000; it has really exceeded, as will be observed by the account appended to this report, £14,300. The income of the year commencing from the 30th of last September may be moderately estimated, as your directors believe, at between £15,000 and £16,000, without calculating on any income to be derived from an addition to the public lights. This addition, if all the public lights originally promised were put up, would be between £4000 and £5000 per annum. That these additional lamps will be ultimately established there can be no doubt, and your directors are not without hope that a portion may be put up within the current year. The income, however, from private lights and residual products is steadily advancing.

Further capital is required—

1st. For the keeping in hand a stock of coal, the cost of which must, of course, always be in advance of the repayment in the shape of gas consumed.

2ndly. For Messrs. Lambert's stock in trade and for various gas-fittings, which will, however, independently of their promoting the use of gas, yield a return of 15 per cent.

3rdly. For the various arrangements and outlays connected with utilizing the residual products, which will also give a large return.

For adequately providing for these objects from £15,000 to £20,000 will be required.

There are also some other incidental expenses and sources of outlay, which, coupled with the convenience of having at command some moderate amount of funds, induce your directors to think it advisable to create £25,000 of additional capital.

This sum they propose to raise by the creation of 2500 additional shares, whereof 1710 will be offered to the proprietors of existing shares in the proportion of one new to every six old shares: of the remaining 790 shares, between 300 and 400 will be taken in payment by Messrs. Lambert, the remainder to be disposed of as the need for further funds may arise.

Upon a comparison of the receipt and expenditure of the company for the half year ending Sept 30, 1865, your directors recommend a dividend at the rate of £6 per cent. per annum, free of income-tax.

Two of your directors, namely, Henry Whiting, Esq., and Joseph Quick, Esq., retire by rotation, but are eligible for re-election, and offer themselves accordingly.

Mr. Ernest Oswald Coe and Mr. Joseph Quick, jun., the auditors of the company, retire from office, and, being eligible, offer themselves for re-election.

Dr. *Balance-Sheet, Sept.* 30, 1865. *Cr.*

To Loans	£5,000	0	0	By Works and extensions	£98,117	11	2
Share instalments	100,000	0	0	Coals	4,032	1	9
Profit and loss	4,131	19	2	Gas-fittings	430	12	2
				Suspense account (exchange)	220	9	9
				Public lights, residual products, &c.	2,013	15	11
				Messrs. Glyn & Co. (balance at bank)	1,054	13	5
				Messrs. Mauà & Co. (balance at Parà)	3,232	4	7
				Balance of petty cash in secretary's hands	30	10	5
	£109,131	19	2		£109,131	19	2

Dr. *Revenue Account for the year ending Sept.* 30, 1865. *Cr.*

To Coals carbonized	£4,231	5	0	By Balance brought forward	£ 970	13	9
Wages	1,792	4	11	Public lights	8,359	17	10
Repairs	10	11	11	Private lights, &c.	2,954	4	6
Directors and salaries of officers	1,363	16	6	Meter-rental	78	8	3
Rent, stationery, and sundries	278	8	6	Residuary products, &c.	1,967	12	9
Lime	49	14	6	Interests	17	3	5
Dividends	2,490	0	0				
Balance of gain carried forward	4,131	19	2				
	£14,348	0	6		£14,348	0	6

The CHAIRMAN, in moving—"That the report of the directors to the shareholders, as read to the meeting, be and is hereby approved and adopted," said the directors thought it well on this occasion to lay before the proprietors a more elaborate report than usual, that they might fully understand the grounds on which they were recommended to increase the amount of their capital. It told them a remarkable tale of a great and steady increase in their business. Considering that the company was incorporated so recently as 1862, that only two years had elapsed since they held their first ordinary meeting, and that it was not until June, 1864, they were able to transmit gas through their mains at Parà, it was most gratifying to find themselves already in the possession of an income of from £15,000 to £16,000 per annum. Had it not been for the unfavourable circumstances mentioned in the report, it would have amounted to £20,000—an instance of success without a parallel in the history of similar undertakings. There was only one single matter of disappointment, and that was, that there was not a larger increase in the number of public lights; but that was only delayed. Every circumstance, however, had been more satisfactory than they had anticipated. They had now to supply 759 public lights and 1495 private renters. In putting out the company's prospectus, they stated on reliable data that they might expect to light 87 shops and institutions, 1200 public lamps, and 3000 private burners; but they had not yet one-tenth of the number of private lights which he hoped they would in the course of a few years obtain. They had, too, owing to the energy of their local manager, Mr. Wilson, created a market for the sale of all the residuary substances connected with the manufacture of gas, as that gentleman had succeded in showing the natives the advantages of coke over wood fuel. The company's coke, too, was in use in the steamboats plying on the river Amazon. Mr. Wilson was also about to utilize the native products. He proposed to extract the oil from the Brazilian nuts, and then extract gas from the crushed mass. The gas so obtained had a high illuminating power. It should, too, be borne in mind, that in proportion to the advances which Parà made in trade and prosperity, so would the business of the company increase. It was the principal port on the Amazon, and it was simply impossible for them to over-estimate the amount of commerce which would in a few years be brought down the Amazon. For the reasons referred to in the report, the directors had sent out 4000 tons of coal, which was more than one year's consumption, but it was highly important to have a sufficient stock on hand. They had, too, purchased the gas-fitting stock of Messrs. Lambert and Son, and reaped a profit of from 10 to 15 per cent. by renting them out. These were the enlargements of the company's business which rendered the increase of their capital necessary. Owing to the present state of the money market, they had come to the determination to raise that capital among themselves in the manner proposed in the report. By that arrangement those shareholders who did not hold six shares would be enabled to increase their holding.

Captain CLARKE seconded the motion, which was unanimously adopted.

The following resolutions were also adopted:—

"That the interim dividend paid to the shareholders at the rate of £5 per cent. per annum, for the half year ending the 30th of June last, be and is hereby confirmed; and that a half year's dividend, up to the 31st inst., at the rate of £6 per cent. per annum, be payable to the shareholders on and after the 18th of January next."

"That Henry Whiting, Esq., one of the two directors retiring by rotation in accordance with the Articles of Association, be and is hereby re-elected."

"That Joseph Quick, Esq., the other director retiring by rotation in accordance with the Articles of Association, be and is hereby re-elected."

"That Ernest Oswald Coe, Esq., and Joseph Quick, jun., Esq., be and are hereby re-elected the auditors of the company for the ensuing year, and that they be paid the sum of £20 each as a remuneration for their services."

The meeting was then made special, and the following resolution was unanimously adopted—"That the nominal capital of the Parà Gas Company, Limited, be increased from £100,000 to £125,000, by the creation and issue of 2500 new shares of £10 each, and that 1710 of such shares be offered to the members holding the shares of the company, and registered on the 1st of January, 1866, in the proportions of one new share to six original shares, and that the remainder of such new shares be allotted to such persons as the directors may determine; and that so many of the new shares as are not taken by the shareholders within the time to be limited by the directors for that purpose may be allotted or disposed of in such manner and at such time or times as the directors think fit. That a first instalment of £2 per share be payable on the new shares so issued on and after the 20th day of January instant, and that the subsequent calls shall be made by the directors at such time or times and in such amounts as they shall think fit; provided that no call exceed £2 per share, or be made at an interval of less than three months. That the proprietors of the new shares shall have the option of paying the calls in advance, upon which the same dividend as is paid upon the remaining share capital of the company shall be paid."

It was also resolved—"That the best thanks of the meeting be given to the chairman and directors of the company for their efficient services in the conduct of the company's affairs during the past year."

FLINTSHIRE OIL AND CANNEL COMPANY.

THE PROPOSED BILL FOR SUPPLYING CHESTER WITH PARAFFIN GAS.

An Extraordinary General Meeting of the Shareholders in the above Company was held at the Clarendon Rooms, South John Street, Liverpool, on Thursday, Dec. 21. Mr. E. G. SALISBURY occupied the chair. There was a numerous attendance of shareholders.

The CHAIRMAN moved the first resolution, which was as follows:—"That on the recommendation of the directors it shall henceforth be part of the business of the company to make the light called 'Paraffin Light,' as well as oil and paraffin, and to make, maintain, and use works for the purpose, and to supply paraffin light for public and private lighting." In proposing the resolution he explained at great length the objects of the bill which the company are promoting, and which seeks power to supply Chester and other places with the paraffin light. In reviewing the clauses of the bill, he showed that the Chester Gas Company were compelled by Act of Parliament to supply the public with a light of 15 sperm candles, while, by this bill, the promoters proposed to give a light of 16 sperm candles. The highest charge for the light would be 3s. 6d. per 1000 cubic feet; reducible, according to dividend, to 3s. He then came to the question, if the public had gas in Chester, who would take the light from them? His answer to that would be a very plain and precise one. He told them, at their last meeting, that he had a delicacy in moving in this matter, because he had been the chairman of the Chester Gas Company. But he had no delicacy in stating this: If the Chester Gas Company had done what he had always urged them, moderated their large dividend upon their very large capital, and reduced the price of the article to the public, and maintained their Act of Parliament standard, there would have been considerable difficulty in successfully getting Parliament to grant powers to any other company. He had written private letters to shareholders in the company urging them to do what he was now suggesting to the shareholders of that company, and he had even gone so far as to tell some of them that opposition would be got up to them if they did not lower their price and improve the quality of their gas. But, of course, they were the best judges of their own interests, and he had no right to complain. He had told them at the last meeting that so far as he was concerned he would not move in this matter until he was first authorized to confer with the Chester Gas Company. Directly after that meeting took place he saw the chairman of the Chester Gas Company, and told him what they were going to do. On the 15th November notice of this bill appeared in the *Chester Courant*. On the 17th November he wrote a letter to the chairman of the gas company, urging him to meet him. He asked them to meet him to negotiate, but he got no reply until the 28th November. Then he got what he considered a fair, frank reply to his letter. But they put to him varied questions with regard to the supply of the article, illuminating power, and other things, some of which he could, and some of which he could not answer with justice to this company. On the same day that he received that letter he wrote a reply, urging them to meet him at once, and stating that he must go on and lodge the bill. On Saturday last the bill was lodged. On Mon-

day he wrote to the chairman privately, urging him to meet him, and on Tuesday he received a reply, in which the chairman said he would meet him at a private meeting. At half-past eleven on the previous day he received a note from the chairman of the gas company, stating that he was ill, and asking him (Mr. Salisbury) to put the thing off until Friday. He appealed to them whether he had not taken every step in the interests of that company, and he asked them to confirm by their resolution that, so far as the Flintshire Oil and Cannel Company were concerned, they had manifested every disposition to meet the Chester Gas Company, and save expense to each party.

The motion was seconded by Mr. RUMNEY, of Manchester.

Mr. NICHOLLS concurred in the importance to the company of the projected bill, but would like to know whether they were going about the matter in the most economical manner. He should like to know if overtures could not have been made to the Chester Gas Company previous to the meeting at Chester in November last. He believed that if overtures had been made the Chester Gas Company would have met this company on fair and amicable terms.

The CHAIRMAN said he must ask whether the speaker was a shareholder in the Chester Gas Company.

Mr. NICHOLLS: I am not a shareholder in the Chester Gas Company.

The CHAIRMAN: But is your wife?

Mr. NICHOLLS must admit that his wife was slightly interested. (Laughter.) He contended that before a large amount was spent in promoting a bill in Parliament, strong efforts should be made by both companies to effect an arrangement. In order to effect this he would move an amendment.—"That to avoid unnecessary expense and litigation, a deputation consisting of the chairman and two directors of both companies should confer with a view to effect an amicable settlement of the question."

Mr. DUKE seconded the amendment, and contended that it was the duty of the board to arrange with the gas company—that he did not think proper steps had so far been taken to do so—that if the resolution was passed the gas company would oppose the bill, and, if beaten, lower the price of their gas. He said that the chairman had left this in the dark as to cost of works, &c., and that it must not be forgotten that it was the chairman who had built up the gas company as it now existed at Chester, and that he now proposed to kill his own child. He strongly urged the shareholders to pass the amendment, and so give further opportunity for settlement.

Mr. Fildes, M.P., Mr. Forward, Mr. Rae, Mr. Ravenscroft, and several other gentlemen spoke in favour of the original motion, and urged Mr. Nicholls to withdraw his amendment.

The CHAIRMAN, in his reply, expressed his regret that any shareholder in the Flintshire Company should have raised the issue suggested by the amendment after the statement he had made. He did not of course blame Mr. Nicholls for looking after his wife's interest in the gas-works, nor Mr. Duke for making the best case he could for his friends or clients; but the statements which those gentlemen had made necessitated a reply from himself, and in self-defence and on behalf of his colleagues he must answer fully all that had been said. It was quite true, as stated by Mr. Duke, that he had himself succeeded in building up the Chester Gas Company. When he took the thing in hand it was, as he stated, in a state of absolute insolvency, but in the amalgamating of the two Chester Companies they found the strongest possible argument in favour of settlement. Their capital for small works and about 17 miles of main (the largest being 12 inches) was about £70,000; their rental about £15,000 per annum; their price 4s. 6d. per 1000 feet; their dividend upon ordinary shares for the past three years something approaching 12 or 15 per cent. Now he said that in that very strong point lay all their weakness, and if the shareholders present passed the resolutions before them, and they had to proceed to Parliament for their bill, they would put up works of double the capacity of the Chester works, with a leading main of 18 inches, with 20 miles of pipes, at a cost of about £25,000; they would at once reduce the rental to £10,000 per annum, and save in that way to the public of Chester about £5000 per annum; their highest price must be 3s. 6d., their dividend 8 per cent., and when they could divide 10, then the price under their bill must be reduced to 3s. per 1000 feet. He said with confidence, therefore, that upon further grounds Parliament must undoubtedly pass their bill. Mr. Duke said further that the Chester Gas Company would oppose them in Parliament, and that, if they failed to throw out their bill, they would then reduce their price and compete with them. His answer was, let them do both things if they liked. He had a shrewd guess that they would not succeed with Parliament, and they would then, no doubt, lower their price.

Mr. DUKE: They have, or are about to give notice to do so at once.

The CHAIRMAN: More fools they for talking of such a thing now, for the public and Parliament would at once see through that dodge, and deal with the company accordingly. Get] rid of this bill and they would again raise their price. Failing in their opportunity, they must, of course, do the same thing with this manifest advantage—the gas company, if they lowered their price to 3s., would have no dividend. This company certainly would not get so much as they expected, but whatever they did get must be to the good, their waste article cost them little or nothing, whereas the Chester Gas Company would, at all events, have to pay for what they make, and he fancied that he need hardly predict how a fight of that sort must terminate in the end. Mr. Nicholls said settle with the Chester Gas Company; so did he, but then there must be two parties to the settlement. He had already said what he had proposed, let the Chester Gas Company say what they would do, and there would soon be a settlement; but pass Mr. Nicholls' resolution and there would be none, it merely sent them to work with instructions at their backs—he needed none personally—and he ventured to think that if Mr. Nicholls allowed his good lady to look after her own interests in the gas company, and he joined the board of this company in looking after his own interests in the Flintshire Company, the thing would work much better for all parties. Prudence suggested that he should not enter further into that part of the case, but he ventured with great confidence to ask the shareholders to reject the amendment, and to carry the original resolution by so large a majority as would place the matter beyond doubt as to their intentions and determination in this respect.

The amendment was afterwards withdrawn, and the original motion carried, amid great applause, unanimously.

Considerable discussion also ensued upon the two following resolutions, which were eventually carried:—"That a special Act of Parliament for authorizing the company to supply the city of Chester, and places in the neighbourhood thereof, with paraffin light, and for conferring on the company all proper powers and authorities for the purpose be applied for." "That the directors be and they are hereby authorized and empowered to increase the nominal capital of the company by the issue of 5000 new shares, of the nominal value of £10 each, to which shall be attached a preferential dividend at the rate of £7 per centum per annum. Provided that if at any yearly or other division of the profits of the company, the amount of such profits shall be insufficient to enable the dividend to be paid in full upon the said preference shares, then, and so often as the same shall happen, if at the next or any subsequent division of the profits, the profits shall be sufficient to leave a surplus after payment in full of the then current dividend upon such preference shares, such surplus shall from time to time be applied in payment of any such preceding deficiency until the whole of the deficiency shall have been made good; and until the whole of such deficiencies shall have been made good, no dividend shall be paid upon any other shares. Provided also, that it shall be lawful for the holder or holders, for the time being, of any such preference shares, the total amount of which shall have been paid up at any time within three years from the allotment thereof, to require the directors of the company to exchange such preference shares for ordinary shares in the company, on the terms following, viz.—There shall be issued to the holder or holders of preference shares desiring to exchange them as aforesaid, such number of ordinary shares as the calls upon, if they had been part of the ordinary shares originally allotted, would at the date of such allotment have amounted to the same amount as the preference shares to be exchanged therefor. And upon such allotment the holder or holders of such preference shares shall deliver up the certificates thereof to the directors, by whom the same, and the shares represented thereby, shall be cancelled, and such shares shall not afterwards be reissued. Provided also, that the holders for the time being of ordinary shares, issued in exchange for preference shares, shall be liable for all calls to be made on such ordinary shares after the issue thereof as aforesaid."

In answer to questions, the CHAIRMAN stated that the new shares would be offered *pro ratâ* to the original shareholders; that if not more than half was taken up, they, the directors, must make a further call on the old shares. That if more than half was taken up, the residue must then be offered to the former applicants, and if any remained after that the board hoped to be able to deal with them. As to calls upon those shares he proposed to make a deposit, and then two calls at intervals to suit as far as possible the convenience of shareholders. In answer to a further question he said that Mr. Howarth was still a director of the company, and that he was also a director of the Leeswood Gas Company, with which they had a contract. There was nothing in their deed that compelled him to resign, but he was bound to say that, had the case been his own, he would have resigned his seat at the board immediately after the expression of opinion at the last meeting. (Applause.) Mr. Howarth had a right to please himself, nor could he do more than he had done.

A vote of thanks, proposed by T. B. Forward, Esq., and seconded by J. Fildes, Esq., M.P., having been given to the chairman, the proceedings terminated.—*Chester Courant.*

SALE OF GAS ACT.

CITY OF LONDON QUARTER SESSIONS.

At a Meeting of the Magistrates and Justices of the Peace for the City of London, assembled in Quarter Sessions, at Guildhall, on Saturday, the 6th inst.—the Right Hon. the LORD MAYOR in the chair,

The CLERK of the PEACE (Mr. Read) read the following report from the committee of magistrates appointed by the court to carry out the provisions of the Sale of Gas Act in the City of London:—

To Her Majesty's Justices of the Peace for the City of London, in Quarter Session assembled, on Saturday, the 6th day of January, 1866.

Whereas, at the Court of General Quarter Session holden for the City of London, on the 19th day of October, 1861, an order of reference was made to a committee of the whole court of justices for them further to carry out the Act of Parliament for regulating measures used in sales of gas.

Your committee, in pursuance of the said order of reference, report that, from the 12th of August, 1861 (the commencement of operations at the gas office), 185,156 meters have been tested, of which number 9671 have been tested since the last return (23rd of Sept., 1856); and for these last-mentioned meters, fees amounting to the sum of £318 12s. 6d. have been received, which said sum will be duly paid to the Chamberlain of London to the account of the Commissioners of Sewers.

Your committee further report that, in addition to the salaries already paid by the Commissioners of Sewers to the inspector and his assistants, the following expenses have been necessarily incurred in carrying out the requirements of the said Act:—

Gas (Great Central Gas Consumers Company) to 20th of Dec.	£17	12	5
Water (New River Company) four quarters to Christmas, 1865	3	15	8
Mr. Gravatt, stationer, for stationery, sealing-wax, &c.	3	0	0
Inspector, petty cash to 24th of Dec.	2	18	7
Mr. Youle, clerk to the justices, fire insurance, and other disbursements made by him	9	3	0

Your committee recommend that orders be made, in pursuance of the Statute, upon the Commissioners of Sewers for the payment of the several expenses incurred by them as aforesaid.

Dated this 5th day of January, 1866.

(Signed) SAMUEL WILSON, Chairman, and others.

It was resolved that the report be approved and confirmed, and that orders be made upon the Commissioners of Sewers for payment of the several amounts therein named.

RESEARCHES ON THE VOLATILE HYDROCARBONS.

By C. M. WARREN.

[From the *Memoirs of the American Academy* and *Silliman's Journal.*]

(*Continued from page* 790, *vol.* XIV.)

PART II.—*On the Influence of C_2H_2 upon the Boiling-points in Homologous Series of Hydrocarbons, and in some Series of their Derivatives; with critical observations on Methods of taking Boiling-points.*

It is well known that we are indebted to H. Kopp (*a*) for the discovery of certain definite relations existing between the chemical constitution and some of the physical properties of homologous liquid bodies. Of these, one of the most important is that of a uniform difference between the boiling-points of the contiguous members of an homologous series, corresponding to the uniform difference in their elementary constitution. Kopp has shown by numerous examples, that, as a general rule, in those series which are characterized by a common elementary difference of C_2H_2 between the members, in the order of the series, the corresponding difference of boiling-point is about 19° C.; hence, that the difference between the boiling-points of any two members of such a series is x .19° for a difference of x C_2H_2 in

(*a*) *Ann. der Chemie und Pharmacie*, 1842, xli., 79, 169; 1845, lv., 177, &c.

the elementary formulæ. In the earlier observations on this subject, this relation between the boiling-points and formulæ was found so nearly constant in the different series examined, that any deviations from this apparent general law were referred, not unreasonably, to assumed inaccuracies in the determination of the boiling-points of the bodies compared. But the more recent and extended generalizations of Kopp (*b*) have led him to point out several exceptional series, in which the boiling-point difference is greater, and others in which it is less, than 19° for an elementary difference of $C_2 H_2$. That there are such exceptional series is confirmed in a very decisive manner by my own observations, as I shall proceed to show. My determinations make the boiling-point differences in some cases so much larger than those of other observers as to leave no room for doubt on this point; especially if the comparative value of these determinations be duly estimated with reference to the more reliable character to which the preparations are entitled, on account of the more efficient means which I have employed for separating the liquids. Since Kopp first called the attention of chemists to this subject, different theories have from time to time been advanced by Schröder, Löwig, Gerhardt, and others, and supported by laborious research and observation. It will be interesting to examine some of these theories in the light of the new facts which I am about to present. Schröder, (*c*) not satisfied with Kopp's explanation of the discrepancies between the observed and theoretical boiling-points, on the ground of errors of determination of the former, argues that the influence of $C_2 H_2$ on boiling-points is variable in different series according to the peculiar nature of the C_2H_2 in each case. He regards organic compounds for the most part made up of radicals, which he calls "components," of which he makes seven. Three of these are composed of carbon and hydrogen, viz.:—

Formyl=(C_1H_2)—"(C_1H_1)"—which is supposed to raise the boiling-point of a substance 52° C.

Methylen=$(C_2H_2)^m$—"$(C_2H_1)^m$"—which is supposed to raise the boiling-point of a body 21°.

Elayl=$(C_2H_2)^e$—"$(C_2H_1)^e$"—which is supposed to raise the boiling-point 17°. Subsequently (*Pogg. Ann.*, lxiv., 101) the latter number was changed by Schröder to 16°.

A fourth component was made up of a double atom of hydrogen, (H_2)—"(H_1)"—which was supposed to lower the boiling-point 3°; but this also was afterwards changed to 10° (*Pogg. Ann.*, lxiv., 372). (The other three components, having no direct bearing on the hydrocarbons, are omitted.) By means of these components Schröder (*Pogg. Ann.*, lxii., 188) proposed to calculate the boiling-points of different substances in the following manner:—Having estimated the sum of the influence of the different components of a body, the number 70 was in all cases to be deducted. Subsequently Schröder (*d*) was led to substitute, in these calculations, the influence of the separate elements for that of the components. Each double atom of carbon (C_2) was estimated to raise the boiling-point of a compound 31°; and each double atom of hydrogen (H_2) to lower it 10°. As in the former case, the number 70 was to be deducted from the sum of the influences of the different elements contained in the compound, to give the true boiling-point. Example: calculation of the boiling-point of benzole, $C_{12}H_6$; C_{12}=6C_2; 31×6°=186°; H_6=3H_2; −10°×3=−30°; 186°−30°−70°=86°=the calculated boiling-point of benzole by this method; which agrees exactly with the latest determination at the date of Schröder's memoir.

Löwig (*e*) estimates the influence of the elementary atoms on the boiling-point differently from Schröder; and obtains numbers such that, to find the boiling-point of a compound it is only required to add together the numbers corresponding to the elementary atoms which it contains, without deducting from this sum a constant number, as by Schröder's method. According to Löwig's theory, one atom of carbon (C) raises the boiling-point 38°·4, and one atom of hydrogen (H) lowers it 29°·2; these numbers being for carbon nearly two and one-half times, and for hydrogen nearly three times as great, as those of Schröder.

Gerhardt, (*f*) in a special paper "On the Boiling-Point of the Hydrocarbons," observes that "The boiling-point of the hydrocarbons appears to obey a very simple law, according to which it is raised or depressed a certain number of degrees, corresponding to the number of equivalents of carbon or hydrogen contained in its equivalent." (*g*) From a comparison of the boiling-points and formulæ of several well-known hydrocarbons, the determinations of which were repeated with special care for this purpose, Gerhardt finds that the addition of C_2 to the molecule of an hydrocarbon raises its boiling-point 35°·5, and that the addition of H_2 lowers it 15°. The boiling-point of a body is calculated from these numbers by comparing its formula with oil of turpentine, $C_{20}H_{16}$, as a standard, the boiling-point of which is taken at 160° C. Example: cumole (from cuminic acid) has the formula $C_{18}H_{12}$; hence it contains C_2 less than oil of turpentine; therefore 35°·5 must be deducted from 160° (the boiling-point of oil of turpentine), which leaves 124°·5; but as the cumole contains $2H_2$ less than oil of tupentine, 15°×2=30° is to be added to the above remainder; thus 124°·5+30°=154°·5, the calculated boiling-point of cumole. Gerhardt's direct determination was 153°, which very nearly coincides with his theory.

It would be foreign from my purpose on the present occasion to consider these different hypotheses, or even the empirical law of Kopp, beyond their special relation to the boiling-points of the hydrocarbons, and such other series, derivatives from the hydrocarbons, as have been made the subjects of my own experiments. Anything more than this would be merely speculative. The want of more accurate determinations of boiling-points as essential to safe and reliable deductions and generalizations on this question has frequently been observed. The need of this will be made strikingly apparent by comparison of my results with those of previous observers. Indeed, if my determinations may be taken as a criterion—which, considering the nature of the materials operated upon, might not be quite fair—the inaccuracies of the boiling-points which have hitherto been published are probably so numerous, and in many cases so considerable, as to make it appear almost useless to attempt further generalizations upon those unreliable data. It may be hoped, however, that the superior means which my process furnishes for separating mixtures of liquids will lead to the accumulation of reliable facts of sufficient number and variety for a profitable review of this question in its different bearings, which, from its importance, it clearly merits.

The frequent inaccuracy of the determinations of boiling-points, upon which Kopp has justly laid so much stress, may, I think, be more reasonably attributed, at least in a majority of cases, to a want of purity in the substances themselves, rather than to a neglect of the precautions and corrections which he recommends to be observed in such determinations; although errors as great as those mentioned by Kopp (*h*) may doubtless occur, and in the particular instances which he had in mind may have occurred from the cause which he assigned for them. It should be borne in mind, however, that these errors, in the case of an impure substance, may be compensating errors; or, on the other hand, they may go to increase that which would arise from impurity.

That the conditions under which my results have been obtained may be clearly understood, and hence the value of these results fairly estimated, in comparison with those of others, I shall endeavour, as I proceed with these researches, to specify, in sufficient detail, the processes which I have employed. Having, in the memoir previously referred to, described the process by which the hydrocarbons were separated, the special object of this paper only requires, in this regard, that I should add a description of the method employed in determining the boiling-points of these bodies, which has already been partially given in the foregoing memoir, when treating of the boiling-point of benzole.

Of the Method of determining Boiling-points.—I use for this purpose a small tabulated glass retort, and usually operate on about 150 c. c. of the liquid. The thermometer extends into the liquid, even nearly to the bottom of the retort, taking care that the bulb shall not come in contact with the glass, but remain free in the liquid. To prevent abnormal elevation of temperature from adhesion to the glass,—which I have observed in some instances, when operating on impure hydrocarbons, to amount to several degrees, I introduce pieces of sodium, instead of platinum, as it seems to serve at least as well for this purpose, and at the same time tends to preserve the purity of the material. Sodium has also this advantage over platinum for hydrocarbons—viz., that it does not lose its virtue by use, so long as any of it remains; platinum, on the contrary, being liable, especially if the liquid is not quite pure, to become after a while slightly coated, and its efficiency thus impaired. (*i*)

Except for low temperatures, the retort rests on a piece of wire gauze laid over the ring of an iron lamp-stand, and is heated with a small gas flame. When operating on liquids of low boiling-point, I have observed the liability of the thermometer to be considerably affected by the ascending current of hot air striking the sides of the retort above the level of the liquid, thus causing an elevation of several degrees of temperature. To prevent this, I proceed as follows. For low temperatures, and yet above the common temperature, I place upon the gauze on which the retort is to stand a screen of felt or thick woollen paper, which has been provided with a hole in the centre about two inches in diameter. This screen extends several inches from the sides of the retort, and has been found effectual for the purpose.

For temperatures below the common temperature, the retort is set in a water-bath containing ice-water, the temperature of the bath being gradually raised by means of a small gas-flame.

As is customary, in order to ascertain the temperature by which to calculate the correction for the upper column of mercury, a thermometer is attached, by means of elastic bands, to the side of the thermometer in the retort; the bulb being placed, during ebullition, midway between the centre of the cork and the upper extremity of the mercurial column. And, as usual, a paper screen, closely fitting the thermometer, is placed across at the top of the cork to shield the upper column of mercury from the direct influence of the ascending heat.

I have observed that it often requires considerable time—variable according to its length and the thickness of the glass spindle—for that part of the thermometer above the retort to acquire the highest temperature which the boiling liquid can communicate to it. During this time the thermometer evidently is not in a fit state for an observation. While this gradual change in the condition of the thermometer is taking place, it is desirable, for obvious reasons, that no vapours should escape from the retort. I therefore proceed as follows:—The retort, the neck of which has previously been wrapped with a wet cloth, is placed in such a position that the neck shall slightly incline towards the body of the retort. If necessary, some pieces of ice, which will adhere firmly to the cloth, may be laid along the neck to insure complete condensation of the vapours during ebullition. While the retort is in this position, ebullition is continued for considerable time, until it ceases to have any effect on the height of the mercury in the thermometer. The lamp being now removed for the moment, the neck of the retort is turned down, and quickly connected with a Liebig condenser. The lamp being now replaced, the distillation is commenced. So soon as the mercury in the thermometer shall have become constant, which will now occupy but a few seconds, the temperatures by the retort thermometer and the side thermometer are carefully noted, and also the time at which these observations are made. During the distillation, which is continued nearly to dryness, the readings of the thermometers and of the watch are noted at regular intervals, or so often as any appreciable variation of the retort thermometer shall have taken place. The average of the several observations, or of those corresponding to the longer intervals of time, applying the corrections for atmospheric pressure and for the upper column of mercury, according to Kopp, (*k*) is taken for the true boiling-point. I have generally obtained the hydrocarbons so pure that the whole quantity operated upon would distil within the range of 1° of temperature, and not unfrequently within 0°·5. In a few cases, however, when the quantity of material at command would not permit of the attainment of so high a degree of purity, the distillation would range over two or three degrees; in such cases I have generally taken the average of the temperatures corresponding to the longest interval of time, as probably representing more nearly the true boiling-point of the body. In stating my results, however, I shall give the limits of temperature within which the distillation was effected. The thermometers employed in the determinations were the best that I could obtain from Fastré of Paris; for the temperatures below 100° the instrument used was calibrated, and the scale divided into fifths of a degree. The determinations above 100° were all made with one thermometer.

The method just described differs in some respects from that of Kopp. He objects to the practice of taking boiling-points with the thermometer bulb

(*b*) *Annalen der Chemie und Pharmacie*, 1855, xcvi., 2.
(*c*) *Poggendorff's Annalen*, 1844, lxii., 184, 337.
(*d*) *Pogg. Annalen*, 1845, lxiv., 367; 1846, lxvii., 45.
(*e*) *Idem*, 1845, lxiv., 250.
(*f*) *Annales de Chimie et de Physique*, 1845 [3], xiv., 107.
(*g*) "Il paraît que le point d'ébullition des hydrogènes carbonés est soumis à une loi fort simple, d'après laquelle il s'élèverait ou s'abaisserait d'un certain nombre de degrés suivant le nombre des équivalents de carbone ou d'hydrogène renfermés dans leur équivalent."

(*h*) "Bestimmung des Siedepunkts." *Poggendorff's Annalen*, 1847, lxxii., 38.
(*i*) For common use in fractioning, when not desirable to use sodium, I have found pieces of coke to be more effectual and much more durable than platinum. Not unlikely it would be found equally preferable to platinum for general use in taking the boiling-points of liquids in which sodium could not be employed. It is certain that nothing could operate better than coke for the nitro-compounds and alkaloids derived from benzole and its homologues.
(*k*) *Poggendorff's Annalen*, 1847, lxxii., 38.

immersed in the liquid, (*l*) on the ground that the thermometer in this condition hardly ever indicates a constant temperature, the end of the mercurial column being in a state of motion. He states that a boiling-point taken in this manner may lie several degrees above that found with the thermometer bulb in the vapour. As bearing on this point, I propose, a little farther on, to give the results of a few experiments and observations, which, with others of similar character, have induced me to depart from the now more common custom of taking boiling-points with the thermometer bulb in the vapour.

Under normal conditions, the temperature of the boiling liquid and that of the vapour evolved should be the same. The only disturbing influence which appears to have been specially dwelt upon as likely to alter these conditions in the taking of boiling-points is the liability of some liquids to adhere to the surface of the glass in such a manner as to produce abnormal elevation of temperature, generally attended with irregular ebullition, and consequent fluctuation of the thermometer. To remedy this it is usual to introduce pieces of platinum; iron filings, coal, &c., have also been employed. As above remarked, pieces of coke—or, when admissible, sodium—are found to be more surely effectual with hydrocarbons than platinum. Indeed, during more than three years of experience and careful observation upon a large number of hydrocarbons, I have not yet met with a single instance in which irregular ebullition and its consequent disturbing influence upon the boiling-point might not be completely prevented by these means. Although I cannot, of course, go so far as to say that equally satisfactory results would be obtained with other liquids by the use of coke, it is nevertheless my belief that in a majority of instances such would be the case.

I have dwelt upon this point for the reason that the objections to the custom of taking boiling-points with the bulb in the vapour appear to be even greater than those which Kopp has raised against the opposite course of placing the bulb in the liquid as I shall proceed to show. It therefore becomes a matter of some importance that the objections to one or the other custom should be removed; and I think it will be found easier to overcome the objections to placing the bulb in the liquid, as I have done in the case of many hydrocarbons, even if coke shall not be found equally efficient with most other liquids.

My experience has shown that, when irregular ebullition is effectually prevented, the temperature of the vapour from a boiling liquid is more liable to lead to an erroneous determination of the boiling-point, than the temperature of the liquid itself. The reasons for this are, first, that the vapour is liable to become superheated by the hot air from the flame coming in contact with the sides of the retort above the surface of the liquid; second, that, with the bulb in the vapour, the thermometer is more liable to sudden depression from currents of cool air passing over the retort. If the bulb be in the vapour, the occurrence of either of these disturbing influences would then affect the principal mass of the mercury in the thermometer; while, on the contrary, if the bulb were in the liquid, only the small quantity of mercury in the stem of the thermometer would be subjected to these influences; the liquid then serving as a regulator, and reducing the error from these sources to a minimum. Fluctuations from currents of cold air are comparatively slight, and more easily prevented than those from overheating the vapour. The latter is the more likely to occur the lower the boiling-point of the liquid, or when the quantity of liquid in the retort is small. I have, however, observed from this cause an elevation of 3°-4° in distilling a body boiling as high as 98° C., without an unnecessarily large flame. But the liquid in this instance was pretty low in the retort.

In the case of liquids boiling below the common temperature, it seems indispensable that the bulb of the thermometer should be placed in the liquid. As evidence of this I will here state the results of observations made while occupied in fractioning some exceedingly volatile products from American petroleum.

Experiment 1.—The liquid operated upon boiled at so low a temperature that the distillation was effected by the heat of the surrounding atmosphere. The distillation was conducted in a flask, and the bulb of the thermometer placed in the vapour. The flask was attached to my condensing apparatus, including the "refrigerator, B, fig. 2." (*m*) The temperature of the condensing-worm contained in the "elevated bath, *aa*, fig. 2," (*m*) and also that of the "first receiver, *k*, fig. 2," (*m*) was 11°·5. The temperature of the "cold bath, *ii*, fig. 2," (*m*) was 11°. The condenser in "the refrigerator, B," and the "second receiver," were cooled in a mixture of ice and salt. With the liquid boiling steadily from several points on the bottom of the flask, and the condensed product from the distillation running well from the refrigerator into the "second receiver," not a drop was condensed in any of the apparatus intervening between the flask and the "second receiver," although this part of the apparatus was cooled, as already stated, to about 11°. The temperature of the vapour in the flask at this time was 18°·5, or only 2°·5 below the temperature of the laboratory. These observations show that the liquid was boiling at a temperature considerably below that indicated by the thermometer in the vapour. Additional evidence of this was furnished by the fact that, during the distillation, the exterior of the flask, from the bottom to about one-quarter of an inch above the surface of the liquid, was thickly covered with water condensed from the atmosphere, resembling heavy dew; while above, the sides of the flask were perfectly dry. It was these observations which first directed my attention to the fact that the temperature of the vapour could not in all cases be depended upon for the true boiling-point of a liquid, and naturally led me to make other experiments with special reference to this question.

Experiment 2.—The conditions of this experiment were somewhat different from those of the first. The liquid operated upon was the extremely volatile product collected in the "second receiver" of experiment 1. The flask employed was smaller, and provided with two thermometers; the bulb of one of these was placed in the liquid, and that of the other in the vapour. The flask stood in a water-bath containing ice-water; this bath was also provided with a thermometer. The temperature of the ice-water bath was very gradually raised by means of a small flame from a Bunsen's burner. Temperature of the laboratory, 20° C. Observations during the distillation:—

1.	Temperature of the water-bath	. . . .	10°
	" " boiling liquid	. . .	8°
	" " vapour	. . . .	18°·5
2.	Temperature of the water-bath	. . . .	12°
	" " boiling liquid	. . .	9°
	" " vapour	. . . .	18°
15 minutes later. 3.	Temperature of the water-bath	. . . .	18°
	" " boiling liquid	. . .	10°
	" " vapour	. . . .	14°
10 minutes later. 4.	Temperature of the water-bath	. . . .	20°
	" " boiling liquid	. . .	12°
	" " vapour	. . . .	19°
20 minutes later. 5.	Temperature of the water-bath	. . . .	23°
	" " boiling liquid	. . .	15°
	" " vapour	. . . .	19°

Experiment 3.—The subject of this experiment was a liquid which I had separated from the most volatile product of the redistillation, on a manufacturing scale, of the crude benzole obtained in the distillation of coal tar. The apparatus employed was essentially the same as that used in experiment 1, with the addition of the extra thermometers, as in experiment 2. The condensing-worm in the "elevated bath," and that in the "cold bath," and also the "first receiver," were all cooled in pounded ice. The condenser in the "refrigerator," and also the "second receiver," were both cooled in a mixture of ice and salt. The retort, which stood in a small copper bath containing pounded ice, was charged with about 250 c. c. of the liquid, which had been previously cooled in a mixture of ice and salt. Temperature of the laboratory, 16° C. Observations during the distillation:—

1.	Temperature of the retort-bath	. . . .	0°
	" " boiling liquid	. . .	0°·6
	" " vapour	. . . .	13°·5
45 minutes later. (*n*) 2.	Temperature of the retort-bath	. . . .	0°
	" " boiling liquid	. . .	1°·3
	" " vapour	. . . .	12°·2
15 minutes later. 3.	Temperature of the retort-bath	. . . .	6°
	" " boiling liquid	. . .	1°·8
	" " vapour	. . . .	12°·6
30 minutes later. 4.	Temperature of the retort-bath	. . . .	11°
	" " boiling liquid	. . .	3°·8
	" " vapour	. . . .	12°·4
30 minutes later. 5.	Temperature of the retort-bath	. . . .	14°·5
	" " boiling liquid	. . .	7°·3
	" " vapour	. . . .	13°·8

The apparent inconsistency that the temperature of the boiling liquid should be above that of the heating medium—viz., an ice-bath—which continued during the first forty-five minutes of the experiment, is to be explained by the fact that there was a long column of mercury, above the surface of the liquid, which was subjected to the heating influence of the vapour. I would further remark that the gradual elevation of the boiling-point, as indicated by the thermometer in the liquid, is also only apparent, and is due to the gradual uncovering of the bulb as the liquid was distilled off. At the close of the experiment only about one-fifth of the bulb, which unfortunately was a long one, was under the surface of the liquid. That this is the true explanation is evinced by the fact that during the experiment not a drop of liquid was observed to fall back into the retort from the "elevated condenser," although this was a tube ten feet in length, and cooled to the temperature of 0°.

I will now proceed to give my determinations of the boiling-points of various hydrocarbons, and of some of their derivatives, and then pass directly to consider the bearing of these results on the question concerning the increment of boiling-point for the addition of C_2H_2 in homologous series. (*o*) The data for these considerations may be more conveniently arranged in tabular form, exhibiting at once, in serial order, the formulæ, boiling-points, elementary difference, and the corresponding difference of boiling-point.

1. *Of the Hydrocarbons obtained from Pennsylvania Petroleum.*

1ST SERIES.

Formula.	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil. (*p*)
	°		°	°
C_8H_{10} . .	0·0 (?)			
$C_{10}H_{12}$ . .	30·2 . .	C_2H_2 . .	30·2 . . .	1·5
$C_{12}H_{14}$ . .	61·3 . .	C_2H_2 . .	31·1 . . .	0·8
$C_{14}H_{16}$ . .	90·4 . .	C_2H_2 . .	29·1 . . .	1·0
$C_{16}H_{18}$ . .	119·5 . .	C_2H_2 . .	29·1 . . .	1·0
$C_{18}H_{20}$ . .	150·8 . .	C_2H_2 . .	31·3 . . .	0·8

$150·8 \div 5 = 30°·16$

Average increment of boiling-point for the addition of $C_2H_2 = 30°·16$.

(*l*) Lässt man die Kugel des Thermometers in die siedende Flüssigkeit tauchen, so zeigt fast nie das Instrument eine constante Temperatur, sondern das Ende des Quecksilberfadens ist in stetter hüpfender oder zitternder Bewegung; der auf diese Art gefundene Siedepunkt kann nur mehrere Grade höher liegen, als der, welcher gefunden wird, wenn sich die Kugel des Thermometers in dem Dampf der siedenden Flüssigkeit befindet.

(*m*) See memoir "On Process of Fractional Condensation," *Memoirs of the American Academy*, 1864, and this journal, last vol., p. 327.

(*n*) From this point the temperature of the retort-bath was gradually raised by means of a small gas-flame.

(*o*) In considering this question I shall include the boiling-points of the substances which I have separated from Pennsylvania petroleum, and the oil distilled from Albert coal; reserving for a subsequent memoir all other facts which have been derived from the study of these bodies.

(*p*) The ranges of temperature given in this and in the corresponding columns of the following tables, are for the purpose of showing the impossibility of there having been any essential error in the determinations of the boiling-points; as is evinced by the fact, in each case, that the whole product was found to distil without residue within such narrow limits. With so small a range of temperature, it is evident that it would make no practical difference whether either extreme or the mean of the observations be taken for the boiling-point.

The fact that these substances distil without residue within so short a range of temperature, is also of much value as proof of the existence of the two parallel series in petroleum and in coal oil, with boiling-points so near together [as shown by comparison of the boiling-points of the first with the second series from petroleum; and also of the two corresponding series from Albert coal oil]; especially if this is considered in connexion with the fact, so far as my experience goes, that the quantities of material in one series are generally about equal to those in the other.

That no erroneous conception may be formed as to the degree of purity of the substances treated of in this and the following tables, from a mere inspection of the *ranges* of temperature here given; and in order that the almost absolute constancy of the boiling-points, in most cases, may not be overlooked, I would refer to the preceding memoir for further details concerning the boiling-points of such of these bodies as are therein treated of. For example, it will be found under the head of "Determination of boiling-point" of benzole, that in the distillation it required 50 minutes for the temperature to rise 0°·2; while in one of the following tables it will be seen that the *range* of temperature within which the benzole distilled to dryness was found to be 0°·8. Likewise, by reference to the "Determination of boiling-point" of toluole it will be observed that it was found to boil absolutely constant 48 minutes; while the *range* of temperature given in the table referred to is 0°·7. In such cases as these, the slight rise of temperature which takes place just before going to dryness, is doubtless to be attributed to superheating of the vapour, in consequence of there being so small a quantity of liquid in the retort. Similar instances of absolute constancy of boiling-point to those just cited, might be given from among the products in either series from petroleum and Albert coal; which the *ranges* of temperature given in these tables do not indicate.

2ND SERIES. (*q*)

Formula. (?)	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil.
	°		°	°
C_8H_{10}	8·9			
$C_{10}H_{12}$	37·0	C_2H_2	29·0	0·4
$C_{12}H_{14}$	68·5	C_2H_2	31·5	0·6
$C_{14}H_{16}$	98·1	C_2H_2	29.6	1·2
$C_{16}H_{18}$	127·6	C_2H_2	29·5	1·5
			119·6÷4=29°·9	

Average increment of boiling-point for the addition of C_2H_2=29°·9.

3RD SERIES. (Not completed.)

Formula.	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil.
	°		°	°
$C_{20}H_{20}$	174·9	. .	. .	1·7
$C_{22}H_{22}$	195·8	C_2H_2	20·9	1·5
$C_{24}H_{24}$	216·2	C_2H_2	20·3	2·2
			41·2÷2=20°·6.	

Average increment of boiling-point for the addition of C_2H_2=20°·6.

2. *Of the Hydrocarbons obtained from Albert Coal.*

1ST SERIES. (Not completed.)

Formula.	Boiling-Point	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil.
	°		°	°
$C_{10}H_{12}$				
$C_{12}H_{14}$	59·9	C_2H_2	. .	1·5
$C_{14}H_{16}$	90·6	C_2H_2	30·7	0·5
$C_{16}H_{18}$	119·7	C_2H_2	29·1	0·5
			59·8÷2=29°·9	

The average boiling-point difference, in this series, for the addition of C_2H_2. is therefore 29°·9.

2ND SERIES. (Not completed.) (*q*)

Formula. (?)	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil.
	°		°	°
$C_{10}H_{12}$				
$C_{12}H_{14}$	68·0	C_2H_2	. .	1·0
$C_{14}H_{16}$	98·5	C_2H_2	30·5	0·6
$C_{16}H_{18}$	125·1	C_2H_2	26·6	
			57·1÷2=28°·6	

Average boiling-point difference=28°·6.

3. *Of Hydrocarbons obtained from Coal-Tar Naphtha.*

Name of Substance.	Formula.	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil.
		°		°	
Benzole	$C_{12}H_6$	80·0	..	..	0·8
Toluole	$C_{14}H_8$	110·3	C_2H_2	30·3	0·7
Xylole	$C_{16}H_{10}$	139·8	C_2H_2	29·5	0·4
Isocumole	$C_{18}H_{12}$	169·9	C_2H_2	30·1	1·0
				89·9	

Average increment of boiling-point for the addition of C_2H_2=89·9÷3=29°·97.

4. *Of Cumole from Cuminic Acid, and Cymole from Oil of Cumin.*

Name of Substance.	Formula.	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point found.	Range of Temperature within which the Substance would all Distil.
		°		°	°
Cumole	$C_{18}H_{12}$	151·1	..	..	3·6
Cymole	$C_{20}H_{14}$	179·6	C_2H_2	28·5	1·2

With only a single exception, the results presented in the above tables point clearly to 30° as the common increment for the addition of C_2H_2 in homologous series of hydrocarbons. Indeed, leaving out of the calculation the third series from petroleum (having the general formula C_nH_n)—which must remain anomalous—and also the products from oil of cumin, the average of all the other boiling-point differences is 29°·75. The few individual variations from the number 30°, rarely exceeding a single degree, may reasonably be attributed to errors of the thermometer (especially in case of temperatures above 100°), or in some instances to a want of purity of one of the compared substances; which latter cause I doubt not is the case with the body from petroleum boiling at 37°, as upon this body I had bestowed less labour in fractioning than upon most of the others, on account of the extreme volatility and consequent loss of the substance, by which the quantity had become so much reduced that I could ill afford further loss. In the case, also, of cymole from oil of cumin, and cumole from cuminic acid, in which the boiling-point difference varies only 1°·5 from the common difference of 30°, the want of perfect agreement may be fairly accounted for by the fact that the quantity of cumole at command was too small to admit of continuing the process of fractioning far enough to obtain perfect constancy of boiling-point. In consequence, also, of the quantity being so small, the *determination* of the boiling-point of cumole is less reliable, as this had to be conducted in a test-tube. It came into full ebullition at 148°·4, the temperature rising gradually to 151°·6 (observed temperatures), at which latter temperature it had distilled nearly to dryness. The distillation occupied thirteen minutes in passing over the range of three degrees. The average of the extremes, with the usual corrections for pressure, &c., was taken for the boiling-point. Abel, (*r*) who probably operated on a larger quantity, found the boiling-point of cumole to be 148°. It does not appear that he applied the corrections for pressure and the upper column of mercury. I do not doubt that the true boiling-point of this body will be found to be 150°, which would establish the difference of 30° between it and cymole.

I would here remark that this difference of 30° for the addition of C_2H_2 was first observed while engaged in fractioning Pennsylvania petroleum, and the oil from Albert Coal—substances the most difficult to separate, on account of the presence in each of two parallel series of constituents, whose boiling-points lie so near together.

As no one had preceded me in the investigation of these substances, my mind was as far as possible unbiassed as to the boiling-points of the constituents of these mixtures. I was, however, aware of the beautiful relation between elementary constitution and boiling-point which Kopp had discovered, and familiar with the fact that the more recent investigations had shown the boiling-point difference among homologous hydrocarbons to be about 22°·5. If there was any one thing which more than another tended to bias me, it was the recent work of Church (*s*) on the boiling-points in the benzole series, in which he made the boiling-point difference invariably 22° and a fraction, a number varying but 3° from the theory of Kopp. Soon after the publication of Church's results, however, Kopp (*t*) accepted the number 22°·5 as about the boiling-point difference in this series, therefore regarding it as one of the exceptional series in which the boiling-point difference is greater than 19°. The work of Church had certainly the appearance of having been performed with great care, conducting to a beautiful harmony of results. My confidence in his determination of boiling-points was increased not a little by his alleged discovery in coal-naphtha of xylole, boiling at 126°·2, indicating a more thorough analysis of this naphtha than those which had been previously published. This body, the supposed middle member of the benzole series, had up to that time been regarded as wanting in coal-tar naphtha, although all of the other members, above and below it, were found to be present—an anomaly not easily reconciled with any plausible theory in regard to the formation of these bodies. In view of these circumstances, therefore, I was naturally led, from analogy, to anticipate that the boiling-point difference among the hydrocarbons from petroleum and Albert coal would not vary much from 20°. Not being able, however, to reconcile with previous facts and theories on this subject the indications which were being gradually unfolded by my seemingly unerring process of separation, I was compelled to lay aside all bias, and to regard these indications as pointing unmistakably to a much greater difference of boiling-point for the addition of C_2H_2 than had previously been supposed to exist in this class of substances.

Having finally established beyond question the common difference of 30° for the addition of C_2H_2 among the hydrocarbons from Albert coal and petroleum (the third series from petroleum, with the difference of 20°, had not then been reached), I began to surmise that this difference might be found to be common among all other series of hydrocarbons. In this connexion my mind naturally reverted to the earlier determinations of the boiling-points of the members of the benzole series, some of which, especially those of benzole and toluole, which had been more studied than the others, indicated strongly that 30° might prove to be the true difference for the addition of C_2H_2 in this series. My confidence in Church's determinations thus began to diminish, and finally, I undertook to make a thorough analysis of coal-tar naphtha, the results of which are given in table 3. As there shown, the boiling-point difference in the benzole series is also 30°, and the number of its members is reduced to four, in place of five, as alleged by Church.

This difference of 30°, thus shown to be so common with the hydrocarbons, is so much larger than the difference of 19° which Kopp had found so frequent in other classes of substances, that the discrepancy cannot be regarded otherwise than as conclusive evidence, if such were wanting, that all liquid bodies do not obey the same law in this regard, but that there are unquestionably those series in which the boiling-point difference for the elementary difference of C_2H_2 may be greater than 19°, of which Kopp has already furnished some examples.

That the difference may also be *less* than 19° in some series receives confirmation from the facts presented in the following tables:—

6. *Of the Nitro-Compounds derived from the Hydrocarbons of the Benzole Series*

Name of Substance.	Formula.	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point.
		°		°
Nitro-benzole	$C_{12}H_5NO_4$	212·1		13·8
Nitro-toluole	$C_{14}H_7NO_4$	225·9	C_2H_2	13·4
Nitro-xylole	$C_{16}H_9NO_4$	239·3	C_2H_2	
Nitro-isocumole	$C_{18}H_{11}NO_4$	..	C_2H_2	

7. *Of the Alkaloids derived from the Hydrocarbons of the Benzole Series.*

Name of Substance.	Formula.	Boiling-Point.	Elementary Difference.	Difference of Boiling-Point.
		°		°
Aniline	$C_{12}H_7N$	184·6	C_2H_2	17·1
Toluidine	$C_{14}H_9N$	201·7		
Xylidine	$C_{16}H_{11}N$	216·0*	C_2H_2	
Iso-cumidine	$C_{18}H_{13}N$	..	C_2H_2	

* Not corrected.

In regard to the results presented in the last two tables, it may be remarked, first, that of the difference shown in the table of nitro-compounds—viz., an average of 13°·6, the discrepancy between this and the number 19°, being 5°·6, is so large as to leave no room for reasonable doubt that this is one of those exceptional series in which the boiling-point difference is less than 19° for the elementary difference of C_2H_2. As this series does not appear to have been examined by Kopp, I have taken care to make as accurate a determination of the difference as circumstances would allow. The boiling-points were corrected as usual for pressure and the upper mercurial column. The boiling-points which have already been published of these bodies, so far as I have noticed, appear to have been given in the observed, *i.e.* uncorrected temperatures. The quantities of nitro-benzole and nitro-toluole which I operated upon were sufficiently large, and of a high degree of purity, presenting perfectly constant boiling-points. The quantity of nitro-xylole, however, was not so large as would have been desirable. Although the boiling-point of this body is doubtless very nearly correct, those of nitro-benzole and nitro-toluole are more to be relied upon; and omitting the fraction, the number 14° may, I think be safely taken as the true boiling-point difference in this series. Secondly, that the less striking difference presented in the series of alkaloids, being only 2° under the number 19°, cannot reasonably justify the assumption that this small discrepancy of 2° is attributable to impurity of the substances, or to inaccuracy in the determination of the boiling-points, when it is considered that great care was taken to obtain a high degree of purity and accuracy, and when it is considered also that previous observers have made this discrepancy larger than mine. It

(*q*) I am somewhat in doubt whether the bodies composing this series and the second series from Albert coal have the formula C_nH_{n+2} as here represented, there being some indication that they contain less of hydrogen. For the purpose for which they are now presented, it is immaterial which formula is employed, as the common elementary difference and the boiling-point differences would remain the same; the solution of this question is therefore deferred for a subsequent memoir.

(*r*) *Annalen der Chemie und Pharmacie*, 1847, lxiii., 308.

(*s*) *Philosophical Magazine*, 1855 [4], ix., 256.

(*t*) *Annalen der Chemie und Pharmacie*, 1855, xcvi., 29.

was on account of the fact that so small a discrepancy would naturally raise a doubt as to the reliability of the determinations, and for the reason that Kopp (*u*) has considered this series of alkaloids as agreeing tolerably well with his general law, that special care was taken on my part to arrive at a correct result. I am confident, therefore, that the boiling-point difference here will not be found to vary more than a fraction from 17°. Of the absolute accuracy of the boiling-points themselves I do not speak so confidently, since these depend so much on the accuracy of the thermometer at these high temperatures; but the correction of any errors which may have arisen from this source would not be likely to alter the relation, and the difference between the boiling-points would still remain about the same. This remark applies with equal force as to the reliability of the other boiling-points presented in this paper, especially of those of high temperatures.

It remains now to consider the foregoing facts with reference to the other theories mentioned.

(*To be concluded.*)

COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS IN DECEMBER, 1865.—The following are the returns of the Metropolitan Association of Medical Officers of Health:—

Names of Water Companies.	Tot. solid Matter per gal.	Loss by Ignition*	Oxydisable Organic Matter.†	Hardness.	
				Before Boiling.	After Boiling.
Thames Water Companies.	Grains.	Grains.	Grains.	Degrees.	Degrees.
Grand Junction	21·35	1·28	0·96	12·08	6·10
West Middlesex	21·14	1·02	0·69	13·00	4·99
Southwark and Vauxhall	22·20	1·38	1·10	13·48	5·08
Chelsea	20·19	1·01	1·03	12·00	5·00
Lambeth	20·74	0·98	0·84	12·00	5·89
Other Companies.					
Kent	26·21	0·48	0·19	18·90	6·81
New River	20·60	0·51	0·48	15·00	5,00
East London	24·21	0·92	0·86	15·94	5·86

* The loss by ignition represents a variety of volatile matters, as well as organic matter, as ammoniacal salts, moisture, and the volatile constituents of nitrates and nitrites.

† The oxydisable organic matter is determined by a standard solution of permanganate of potash—the available oxygen of which is to the organic matter as 1 is to 8; and the results are controlled by the examination of the colour of the water when seen through a glass tube two feet in length and two inches in diameter.

SERIOUS FIRE AT THE DUNDEE GAS COMPANY'S WORKS.—On Sunday morning, shortly after one o'clock, a fire of a very singular and dangerous character took place on the works of the Dundee Gaslight Company at Peep-o'-Day Lane. Close to the east boundary wall, which forms the division between the works of the two companies, there are four small gasometers, capable of holding about 40,000 or 50,000 feet of gas each, and these are enclosed on all sides by a wall about twenty feet high. They are of old construction, and the tremendous gale which prevailed on Saturday night had shaken them very much, particularly as they were nearly full of gas. It would seem that the shaking of the gasometer which stands at the north-east corner of the enclosure had broken one of the pillars or supports, and the large mass had tilted over to the east side, and the lower rim being thus partly raised above the level of the water in which it floats, the gas inside had escaped in large quantity. By what means it was ignited is unknown. There is a lamp which stands in the middle of the court, equidistant from each gasometer, and the gas may have risen to the flame in it, or—which appears not at all improbable—the lightning may have caused the ignition. However that may be, the gas was set on fire, and immediately blazed up with great fury. The aperture between the water and the outer rim of the gasometer being of small size compared with the whole surface, the flame continued steadily for a considerable time. The alarm was immediately given, and Mr. Kay, the engineer (whose residence is within the works), was soon on the spot, and took the best means in his power to subdue the fire, and to prevent the possibility of an explosion. The flames rose to a height of fully thirty feet; and the heat was so intense as to melt the cement in the joinings of the other three gasholders, so that the gas also escaped from them, and they were soon encircled with rings of flame. The hose was soon attached to the fire-plug in the works, and water was thrown on the three gasholders to cool them down, and to prevent the gas as much as possible from escaping. The one in which the fire originated was in course of time emptied of the gas, and then all danger of a further extension of the fire was removed. The gas, however, in the other three was run out, and it was found that they were not much damaged. The leaks at the joinings will have to be stopped, but beyond that they appear to have suffered little or no injury. The fourth lies tilted over on its side, and partly submerged in the water, and that side of it on which the fire broke out is crushed and distorted like the side of a partially filled balloon. The walls of the enclosing court are considerably charred, but fortunately they prevented the fire from spreading to any of the adjacent premises, otherwise the consequences might have been very serious. The fire brigade, under Captain Fyffe, were turned out, and rendered valuable assistance in preventing the fire from extending. We believe this accident will not in any way interfere with the supply of gas in the town, as the four gasholders were filled as a kind of reserve—the others being quite sufficient to meet ordinary requirements. No idea can be formed of the extent of the damage until the holders are examined; but we understand the company are not insured.—*Dundee Courier, Jan.* 2.

(*u*) *Annalen der Chemie und Pharmacie*, 1855, xcvi., 24.

ANALYSIS OF THE METROPOLITAN WATERS IN DECEMBER, 1865, BY PROFESSOR FRANKLAND, F.R.S., OF THE ROYAL COLLEGE OF CHEMISTRY:—

Names of Water Companies.	Solid Matter in 100,000 parts of the Waters.	Organic and other Volatile Matter.	Amount of Oxygen required for oxidation of Organic Matter.	Degrees of Hardness.*		
				Permanent.	Temporary.	Total.
Thames Water Companies.						
Chelsea	28·00	1·52	·1942	7·0	9·1	16·1
West Middlesex	28·91	1·49	·1045	6·8	11·9	18·7
Southwark and Vauxhall	31·32	1·98	·1972	7·4	11·5	18·9
Grand Junction	29·51	1·91	·1722	7·4	11·0	18·4
Lambeth	29·06	1·08	·0842	8·8	7·6	16·4
Other Companies.						
Kent	37·45	0·61	·0070	8·8	17·4	26·2
New River	30·02	0·54	·0396	7·0	14·1	21·1
East London	33·90	1·56	·1274	7·2	15·0	22·2
South Essex	38·10	0·86	·0112	5·8	19·0	24·8

The table may be read thus—100,000 lbs. of the Chelsea water contained 28·00 lbs. of solid matter, of which 1·52 lbs. of organic and other matters were driven off by incineration. ·1942 lbs. of oxygen were required to destroy organic matter in the said quantity of Chelsea water. Of the solid matter 16·1 lbs. are carbonate of lime or its equivalent; of which 9·1 lbs. are got rid of by boiling, and 7·0 lbs. remain.

* The degree of hardness hitherto employed by chemists is that first proposed by Dr. T. Clark, viz., one grain of carbonate of lime, or its equivalent, in one imperial gallon of water, or one part in 70,000. The degrees of hardness used in the above table are readily converted into Clark's degrees by multiplying by 7 and then moving the decimal point one place to the left.

With the exception of the water supplied by the Kent and South Essex Companies, the waters again exhibit this month a marked increase in the total amount of solid impurity as compared with last month; this applies also to the water supplied by the Lambeth Company, which was the only one which in October showed no increase of residue over the preceding month. On the other hand, the organic and other volatile matter has (with the exception of the water supplied by the Grand Junction Company) decreased; while the amount of oxygen required for oxidation of the organic matter is in most cases less than in November. The waters of the Chelsea, Lambeth, Southwark, Grand Junction, and East London Companies were turbid when drawn from the companies mains. The second column of this table contains the amount of solid matter left on evaporation and desiccation at 120° C.—130° C. (248° F.—266° F.) The results are recorded in 100,000 parts. By moving the decimal point one place to the right, the above figures express in milligrams the quantites contained in one kilogram of the several waters.

Share List of Metropolitan Gas Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum	Price per Share.
	£		£ s d	£ s d	£ s d
5000	10	Anglo-Romano	10 0 0	9 0 0	10 to 12
5000	20	Bahia (Limited)	20 0 0	3 0 0	17 0 0
1000	20	Do., preference	20 0 0	10 0 0	27 10 0
750	20	Do., do., redeem.	10 0 0	10 0 0	12 10 0
30000	5	Bombay (Limited)	5 0 0	£5 intr.	5⅞ to 5¾
10000	5	Do., third issue	3 0 0	£5 intr.	3⅜ to 3½
10000	20	British, Limited (Norwich, Hull-Sculcoates, Hanley, Tunstall & Shelton [Potteries], Trowbridge, & Holywell.)	20 0 0	10 0 0	29 to 30
12000	50	*Chartered*	50 0 0	10 0 0	69½ to 70
6000	50	Do.	30 0 0	10 0 0	39 to 40
10000	20	*C. of London*, Ash.	20 0 0	10 0 0	28½ to 29
10000	10	Do., B shares	10 0 0	4 0 0	7 5 0
8000	10	Do., new shares	10 0 0	10 0 0	15 to 15½
35000	25	City of Moscow (L)	7 10 0	£7 intr.	5 to 6
17490	25	Colonial & General *Commercial*	25 0 0	10 0 0	37 to 37½
5000	20	Continental G. & W.	6 0 0	6 0 0	
2500	20	Continental Union	20 0 0	8 0 0	18 to 19
17500	20	Do.	10 0 0	8 0 0	9 to 9½
5827	5	County & Gen. (L)	5 0 0		
2000	5	Do., preference (Pater, Pembroke, Ely, Lea Bridge, Northfleet, Walton, & Ware.)	5 0 0	6 0 0	
5000	10	*Crystal Pal. Dist.*	10 0 0	10 0 0	15½ to 16
5000	10	Do., preference	10 0 0	6 0 0	12½ to 13
4000	50	*Equitable*	50 0 0	10 0 0	75½ to 76
4000	25	Do., new shares	25 0 0	10 0 0	38 to 39
23406	10	European (Lim.)	10 0 0	10 0 0	13½ to 13¾
12000	10	Do., new shares (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	5 0 0	10 0 0	6¼ to 6⅜
20000	10	*Great Central Gas Consumers*	10 0 0	10 0 0	14½ to 15¼
5000	10	Hong Kong (Lim.)	10 0 0		11 to 12½
26000	50	*Imperial*, old sh.	50 0 0	10 0 0	79½ to 80
1300	100	Do., bonds	£100	10 0 0	197 to 198
7000	25	Imperial Austrian	10 0 0		
28000	50	*Impl. Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Stolberg, Toulouse, & Vienna	43 15 0	16 0 0	96 to 97
3000	40	*Independent*	40 0 0	10 0 0	65 to 70
3000	10	Do.	10 0 0	5 0 0	8 to 9
3000	20	Do.	10 0 0	7 10 0	11 to 13
6886	50	*London*	50 0 0	10 0 0	72 to 73
5519	25	Do., 1st pref.	25 0 0	6 0 0	29 to 29½
568	50	Do., 2nd pref.	50 0 0	6 0 0	
219	50	Do., 3rd pref.	50 0 0	6 0 0	
18781 *l*		Do., 1st pref. sh.		6 0 0	
11828 *l*		Do., 2nd pref. sh.		5 0 0	
12000	5	Malta & Medit. (L.)	5 0 0	2 10 0	
30000	5	Oriental, Calcutta	5 0 0	8 0 0	5 17 6
30000	5	Do., new shares	0 10 0	8 0 0	0 12 6
10000	5	Ottoman (Limited)	5 0 0		3½ to 4
10000	10	Para (Limited)	10 0 0	£6 intr.	10½ to 11
27000	20	*Phœnix*	20 0 0	10 0 0	32 0 0
3600	100	Do., new	15 0 0	7 10 0	18 0 0
144000	8s.	Do. (capit. profits)		5 0 0	80 0 0
5000	20	*Ratcliff*	20 0 0	10 0 0	31 to 33
	20	Rio de Janeiro (L.)	20 0 0	10 0 0	21 to 21¼
4138	5	Singapore (Lim.)	5 0 0		
2000	5	Do., preference	5 0 0	7 10 0	
		Shanghai			
4000	50	*Sth. Metropolitan*	50 0 0	10 0 0	80 to 82
15000	10	*Surrey Consumers*	10 0 0	10 0 0	14½ to 15
16000	10	Do., new	4 0 0	10 0 0	7 to 7½
9000	50	United General (Dublin & Limerick)	50 0 0	4 12 0	30 to 31
16000	10	*Victoria Docks*			
3000	10	*Wandsworth & Putney*	10 0 0	7 10 0	13¼ to 14
20000	10	Western (Limited A shares	10 0 0	10 0 0	15½ to 15¾
10000	10	Do., B shares	5 0 0	10 0 0	8⅝ to 9
10000	10	Do., C shares	3 0 0	10 0 0	5⅝ to 6
20000	10	Do., D shares	1 0 0		1¾ to 2
8000	5	*West Ham*	5 0 0	7 10 0	6 10 0
6000	5	Do., new shares	3 0 0	7 10 0	3 18 0
551	10	West London Junction (Lim.)	10 0 0	6 0 0	
520	10	Do., preference	10 0 0	6 0 0	

Share List of Provincial Gas Companies.

(Directors and Managers of Gas-Works are earnestly requested to enable us to rectify any errors and fill up the omissions in the following List.)

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£	**ENGLAND.**	£ s d	£ s d	£ s d
360	5	Aberavon (Lim.)	5 0 0	6 0 0	5 0 0
		Aberdare			
		Aberdovey			
400	5	Abergele (Lim.)	5 0 0	4 0 0	5 0 0
		Aberystwith			
530	10	Abingdon	10 0 0	6 0 0	12 0 0
1050	10	*Accrington G. & W.*	10 0 0	& Bns.	15 0 0
1050	10	Do., new shares.	10 0 0		15 0 0
2100	5	Do., do.	5 0 0		7 10 0
2100	5	Do., do.	1 0 0		1 10 0
2100	2½	Do., do.	0 10 0		0 15 0
1200	5	Airdale (Limited)	5 0 0	10 0 0	8 10 0
300	5	Do., new shares.	0 10 0	8 0 0	
24	75	Alcester	75 0 0	4 0 0	80 0 0
128	10	Aldborough (Lim.)	10 0 0	5 0 0	
269	10	Alderney	10 0 0	5 0 0	11 0 0
300	6	Alfreton	6 0 0	5 0 0	5 10 0
		Alnwick			
		Alston Moor			
250	10	Alton	10 0 0	10 0 0	12 0 0
1600	5	Altrincham	5 0 0	6 0 0	6 0 0
		Amersham			
		Amlwch (Lim.)			
170	10	Ampthill	10 0 0	4 0 0	9 0 0
350	10	Andover	10 0 0	6 0 0	12 0 0
358	5	Appleby	5 0 0	2 10 0	2 15 0
260	10½	Arundel	10 10 0	7 10 0	13 0 0
250	10	Ashbourne, Derby.	10 0 0	6 0 0	13 10 0
292	5	Ashburton	5 0 0	5 0 0	
84	30	Ashby-de-la-Zouch	30 0 0	6 0 0	
700	10	Ashford (L.), Kent	10 0 0	6 0 0	11 10 0
1600	30	*Ashton-und-Lyne.*	30 0 0	10 0 0	60 0 0
		Aspatria			
590	5	Atherstone	5 0 0	9 0 0	8 10 0
		Attleborough			
		Axminster			
200	20	Aylesbury	20 0 0	5 0 0	21 0 0
150	10	Aylsham (L.), Nrfk	10 0 0	5 0 0	12 10 0
3093	10	*Bacup (Rossendale Union)* ordinary	10 0 0	& Bns. 8 10 0	16 0 0
600	10	Do., preference	10 0 0	8 10 0	16 0 0
2597	10	Do., new issue	6 0 0	8 10 0	10 0 0
300	5	Bakewell	5 0 0	8 0 0	8 0 0
200	10	Baldock	10 0 0	5 0 0	10 0 0
1000	10	Banbury (Limited)	10 0 0	7 10 0	15 0 0
2650	10	*Bangor Gas & Wr.*	10 0 0	7 10 0	12 0 0
		Barmouth (L) £1500			
260	10	Barnard Castle	10 0 0	5 10 0	10 15 0
800	5	Barnet	5 0 0	6 0 0	5 10 0
		Barnsley £6000		7 10 0	
100	20	Barnstaple	20 0 0	7 10 0	
		Barrow-in-Furness Gas and Water		& Bns.	
1158	2	Barton-on-Humb.	2 0 0	5 0 0	2 0 0
120	25	Basingstoke	25 0 0	8 0 0	35 0 0
120	10	Do.	10 0 0	8 0 0	14 0 0
2500	16	*Bath*, A shares.	16 0 0	8 0 0	} 30 0 0
2500	8	Do., B shares.	8 0 0	7 0 0	} united
2500	10	Do., C shares.	10 0 0	7 0 0	15 0 0
5000	10	Do., D shares.	2 0 0	7 0 0	3 6 6
		Battle £2000		6 0 0	
56	26⅔	Bawtry	26 12 6	6 0 0	25 0 0
		Beaminster			
716	10	*Beccles Gas & Wr.*	10 0 0	2 10 0	
		Bedale, Yorkshire			
300	30	*Bedford*	25 0 0	4 0 0	20 0 0
390	10	Bedworth	10 0 0	5 0 0	10 0 0
300	3	Belford	3 0 0		1 10 0
350	10	Belper	10 0 0	10 0 0	14 0 0
		Berkhampstead			
1086	10	Berwick & Tweedmouth	10 0 0	10 0 0	15 0 0
120	20	Bewdley	16 0 0	5 0 0	16 0 0
200	10	Bicester	10 0 0	5 10 0	11 0 0
		Biddulph, Bradley Green, and Black Bull (Limited)			
330	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
		Billericay			
5000	5	*Bilston*	5 0 0	8 0 0	7 12 6
200	10	Bingham	10 0 0	4 0 0	
		Bingley £7400		4 0 0	
		Birchington (Lim.)			
1200	80	*Birmingham*, A shares.	80 0 0	9 0 0	135 0 0
400	8	Do., B shares.	8 0 0	9 0 0	13 10 0
3750	40	Do., new shares.	40 0 0	7 10 0	56 10 0
2400	50	*Birmingham & Staff.*	50 0 0	10 0 0	96 0 0
2400	25	Do., new shares.	25 0 0	10 0 0	48 0 0
7020	20	Do., do.	20 0 0	10 0 0	38 10 0
12500	28	Do., do.	8 0 0	7 10 0	13 0 0
250	16	*Birstall*	12 0 0	12s. 6d.	12 0 0
		Bishop's Auckland		per sh.	
180	10	Bishop's Castle	10 0 0	5 0 0	10 0 0
230	10	Bishop's Stortford	10 0 0	5 0 0	10 0 0
		Bishp's Wlthm (L)			
6000	15	*Blackburn*, A sh.	15 0 0	9 0 0	27 0 0
6000	15	Do., B shares.	2 0 0	6 15 0	3 10 0
		Blaenavon G. & W.			
		Blandford			
		Blyth & Cowpen			
		Bodmin			
		Bodmin Consumers			
		Bognor			
100	10	Bolsover	10 0 0		10 0 0
3909	16¼	*Bolton*	16 10 0	10 0 0	40 0 0
7466	16¼	Do., new shares.	8 0 0	6 10 0	
		Boroughbridge (L).			
800	10	*Boston*	10 0 0	8 10 0	
1200	10	Do., new shares.		8 10 0	
	5	Boston Spa (Lim.)	5 0 0	6 10 0	5 10 0
		Botesdale (L), Suff.			
200	5	Boughton Blean	5 0 0	5 0 0	5 0 0
193	10	Bourn	10 0 0	5 0 0	
		Bournemouth Gas and Water			
160	10	Brackley	10 0 0	6 0 0	10 0 0
		Bracknell (Lim.)			
		Bradford, Wilts			
	25	*Bradford, Yorksh.*	25 0 0	10 0 0	49 0 0
		Braintree			
		Brampton, Cumb.			
		Brandon, Suffolk			
579	10	Brecon (Limited)	10 0 0	10 0 0	18 to 20
89700 *l*	Sk.	*Brentford*	All.	5 10 0	124 0 0
2000	20	Do., A shares.	1 0 0	7 10 0	
2187	20	Do., preference	20 0 0	5 0 0	20 0 0
313	20	Do.	5 0 0	5 0 0	5 0 0
		Brentwood			
		Bridge, near Cant.			
		Bridge-end, Glam.			
		Bridgenorth (L)			
200	50	*Bridgwater*	50 0 0	7 0 0	50 0 0
520	10	Bridlington (L)	10 0 0	7 10 0	12 10 0
450	10	Bridport	10 0 0	7 10 0	12 0 0
6000	5	*Brierly Hill*	5 0 0	4 0 0	5 2 6
		Brigg			
		Brightlingsea (L)			
3375	20	*Brighton*	20 0 0	8 10 0	34 to 35
675	20	Do., new shares.	4 0 0	8 10 0	8 to 8½
4020	20	*Brighton & Hove*	20 0 0	9 0 0	29 0 0
		Brimscombe (L)			
191250	Sk.	*Bristol United*	Stock.	9 10 0	184 to 185
300	5	Briton-ferry	5 0 0		
150	8	Brixham	8 0 0	5 0 0	
		Broadstairs			
4000	5	*Bromley*, Kent	5 0 0	8 10 0	7 0 0
6000	5	Do., new shares.	1 0 0	8 10 0	1 10 0
		Bromsgrove			
100	10	Bromyard (Lim.)	10 0 0		
		Broughton			
120	10	Bruton	10 0 0	4 0 0	8 to 9
		Brymbo			
100	25	Buckingham	25 0 0	6 0 0	26 to 27
		Buntingford (Lim.)			
500	1	Burley-in-Wharfdale (Limited)	1 0 0	5 0 0	1 1 0
		Burnham, Bucks			
		Burnham (L) Essex			
		Burnham, Somers.			
1600	5	*Burslem and Tunstall*	5 0 0	10 0 0	9 0 0
2560	5	Do., new shares.	5 0 0	7 10 0	7 0 0
440	2½	Burton, Westmoreland (Limited)	2 10 0		
1200	10	*Bury St. Edmd's*	10 0 0	10 0 0	17 10 0
1800	10	Do., new shares.	3 0 0	7 10 0	4 4 0
303	10	Buxton (Limited)	10 0 0	7 10 0	14 0 0
150	10	Caistor	10 0 0	7 0 0	12 0 0
187	5	Callington	5 0 0		5 0 0
215	10	Calne, Wilts	10 0 0	6 0 0	10 0 0
		Calverley (L) York.			
		Camborne			
600	50	*Cambridge*	50 0 0	10 0 0	90 0 0
160	12½	Do., new shares.	12 10 0	10 0 0	22 10 0
640	8¼	Do., do.	4 0 0	10 0 0	6 0 0
240	50	*Canterbury Gas & Water*	50 0 0		45 to 50
240	25	Do., new shares.	25 0 0	£6	22 to 25
240	12½	Do., do.	12 10 0		11 to 12½
240	6¼	Do., do.	6 5 0		5 to 6¼
400	25	*Cardiff*, A shares.	25 0 0	10 0 0	48 0 0
1200	25	Do., B shares.	25 0 0	8 0 0	38 0 0
400	25	Do.	10 0 0	8 0 0	8 0 0
		Cardigan (Limited)			
160	25	Carmarthen	25 0 0	5 0 0	30 0 0
		Carnarvon			
		Carshalton			
200	6	Castlecary	6 0 0		5 0 0
200	10	Castle Donnington	10 0 0	6 0 0	12 14 0
249	5	Castleford	5 0 0	5 0 0	5 0 0
400	5	Castletwn, I. of M.	5 0 0	5 0 0	5¼ to 5½
620	2	Cawood (Limited)	2 0 0	4 0 0	
		Chatteris			
300	10	Cheadle	10 0 0	6 0 0	12 10 0
200	50	Chelmsford	50 0 0	8 0 0	70 0 0
200	25	Do., new shares.	25 0 0	8 0 0	35 0 0
2500	16	*Cheltenham*, A shares.	16 0 0	8 0 0	
2500	8	Do., B shares.	8 0 0	7 0 0	
		Do., new shares.		7 0 0	
500	10	*Chepstow*, A sh.			
200	10	Do., B shares.			
600	5	*Chertsey Consumrs.*	5 0 0	5 0 0	6 15 0
600	1½	Do.,	1 10 0	5 0 0	2 0 0
600	2½	Do.,	1 10 0		
230	10	Chesham	10 0 0	5 0 0	10 10 0
30000 *l*	Sk.	*Chester United*	Stock.	10 0 0	182 0 0
24650 *l*	,,	Do., preference	,,	7 0 0	142 to 144
535	10	Do, new shares.	10 0 0	7 0 0	14 0 0
250	5	Chester-le-Street	5 0 0	6 0 0	5 0 0
19200 *l*	Sk.	*Chesterfield Gas & Water*	100 0 0	5 0 0	178 0 0
400	50	Do., new shares.	50 0 0	5 0 0	52 0 0
		Chesterton (L.)			
240	25	Chichester	25 0 0	6 0 0	31 10 0
		Chippenham			
329	10	Chipping Norton (Limited)	10 0 0	5 0 0	
100	10	Chipping Ongar	10 0 0	2 10 0	5 0 0
838	20	Chorley	20 0 0	7 0 0	27 0 0
		Chowbent, Lanc.			
		Christchurch			
200	5	Church Stretton (L)	5 0 0		5 0 0
680	10	Cirencester	10 0 0	5 0 0 & Bns.	11 0 0
		Clay Cross			
		Clayton, Allerton, and Thornton			
257	10	Cleckheaton, A shares.	10 0 0	7 10 0	
257	10	Do., B shares.	10 0 0	7 10 0	
257	10	Do., new shares.	10 0 0	7 10 0	
350	10	Clevedon	10 0 0	4 10 0	10 0 0
		Clitheroe			
1132	5	Cockermouth	5 0 0	5 0 0	5 5 0
300	5	Coggeshall	5 0 0		4½ to 5
900	20	Colchester	20 0 0	7 0 0	22½ to 23
		Coleford, Gloucester			
		Coleshill (L.) £2000			
160	10	Collingham (Lim.)	10 0 0	5 0 0	10 0 0
		Collumpton			
328	5	Colnbrook, Middsx.	5 0 0	5 0 0	5 0 0
156	20	Colne, Lancashire	20 0 0		36 0 0
150	10	Do., ¼ shares.	10 0 0	£10	18 0 0
150	5	Do., ¼ shares.	5 0 0		9 0 0
150	5	Do., A shares.	5 0 0		9 0 0
150	5	Do., B shares.	5 0 0		9 0 0
150	5	Do., C shares.	2 0 0		5 0 0
200	25	*Congleton*	25 0 0	5 0 0	31 0 0
320	5	Conway (Limited)	5 0 0		5 0 0
		Corsham			
1600	25	*Coventry*	25 0 0	8 0 0	35 0 0
	25	Do., new shares.	25 0 0	7 10 0	
200	10	Cowbridge	10 0 0	3 0 0	5 0 0
500	10	Cowes	10 0 0	5 0 0	
		Cradley Heath			
190	10	Cranbrook. £1900	10 0 0	7 10 0	
		Crawley		4 10 0	
		Crayford & Bexley.			
		Crays			
420		Crediton	5 0 0	5 0 0	6 0 0
225	10	Crewkerne	10 0 0	6 0 0	10 0 0
		Cricklade (L.) £1000			
200	10	Croft & Hurworth	9 0 0		
1200	1	Crook (Limited)	1 0 0	10 0 0	1 5 0
		Croston (Limited).			
251	5	Crowland	5 0 0	7 0 0	
181	10	Crowle, Lincoln	10 0 0	10 0 0	
8000	5	*Croydon Commrcl.*	5 0 0	7 10 0	7 0 0
		Cuckfield			
250	20	Dartford	20 0 0	7 0 0	27 0 0
700	5	Dartmouth (Lim.)	5 0 0	7 0 0	6 0 0
125	20	Daventry	20 0 0	5 0 0	24 8 0
165	10	Dawley	10 0 0	5 0 0	10 0 0
346	5	Dawlish	5 0 0	8 0 0	7 10 0
1400	10	*Deal & Walmer.*	10 0 0	7 0 0	10 0 0
1400	1¼	Do.	1 5 0	4 0 0	4 0 0
350	10	Do.	5 0 0	7 0 0	7 0 0
1200	1	Deddington	1 0 0		
		Dedham (L.) £1000			
		Delph, Yorkshire			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
1650	25	*Derby*	25 0 0	10 0 0	52¼ to 53¼
		Dereham			
7000	5	*Devonport*	5 0 0	9 0 0	9 0 0
3000	5	Do., preference	4 0 0	5 0 0	4 0 0
7400	5	*Dewsbury & Batley*	5 0 0	10 0 0	10 0 0
3700	5	Do., new shares.	5 0 0	7 10 0	7 10 0
		Diss			
		Dolgelly			
160	10	Donnington	10 0 0	5 0 0	10 0 0
340	27½	Dorchester	25 0 0	5 0 0	27 10 0
120	25	Dorking	24 0 0	5 0 0	25 0 0
		Donnington, Linc.			
192	25	Douglas, I. of Man	25 0 0	8 0 0	30 0 0
21945 *l*	Sk.	*Dover*	100 0 0	6 0 0	100 0 0
1855	10	Do., new shares.	10 0 0	6 0 0	10 0 0
500	10	Dowlais (Limited)	10 0 0	8 0 0	12 0 0
25	60	Downham Market.	60 0 0	7 10 0	
		Driffield			
3000	5	*Drighlington and Gildersome*	5 0 0	7 10 0	7 10 0
		Droitwich			
1000	20	*Droylsden*	9 0 0	8 5 0	
600	30	*Dudley*	30 0 0	6 6 0	38 to 40
1500	20	*Dukinfield*	13 0 0	10 0 0	28 0 0
200	10	Dunmow	10 0 0	5 0 0	10 0 0
		Dunstable			
900	10	Durham	10 0 0	10 0 0	£26
900	10	Do., new shares.	5 10 0	10 0 0	
250	10	Dursley, Gloucstr.	9 0 0	6 0 0	9 5 0
150	5	Easingwold	5 0 0	5 0 0	
400	10	Eastbourne	10 0 0	5 0 0	11 0 0
90	20	East Dereham	20 0 0	5 0 0	21 0 0
356	5	East Grinstead	5 0 0	6 0 0	5 0 0
		Easton (Limited)		5 0 0	
1200	5	East Retford	5 0 0	10 0 0	7 10 0
		Eckington & Mosboro' (Limited)			
		Edgware			
		Egremont, Cumb.			
703	6¼	*Elland*	6 10 0	8 0 0	10 0 0
800	5	Elsecar (Limited)	5 0 0	5 0 0	5 12 0
		Eltham			
200	10	Emsworth			
400	5	Enfield	5 0 0	5 0 0	5 0 0
		Epping (Limited)			
300	19	Epsom & Ewell	19 0 0		
		Erith			
325	10	Eton—Cannel Gas (Limited.)	10 0 0	5 0 0	10 0 0
700	10	Evesham (Lim.)	10 0 0	6 0 0	9¼ to 10
1600	25	*Exeter*	25 0 0	8 0 0	40 to 42
250	10	*Exmouth*	10 0 0	5 0 0	10 0 0
58	25	Eye	25 0 0	5 0 0	25 0 0
170	10	Fairford	10 0 0	3 0 0	

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Fakenham(L)£3500			
		Falkingham			
100	38	*Fareham*	38 0 0	5 0 0	
223	25	Farnham	25 0 0	7 0 0	35 0 0
		Farnworth and Kearsley			
		Farringdon			
140	50	Faversham	50 0 0	10 0 0	66 0 0
		Fazeley (L.) £3000			
120	10	Fenny Stratfd.(L.)	10 0 0	5 0 0	11 0 0
	5	Filey	5 0 0	5 0 0	5 0 0
1200	10	*Folkestone*	10 0 0	10 0 0	15 0 0
280	5	Framlingham	5 0 0	5 0 0	5 10 0
1155	1	Frodsham (Lim.)	1 0 0	2 10 0	1 0 0
320	25	Frome	25 0 0	10 0 0	
		Furness G. and W.			
12000*l*	Sk.	*Gainsborough*	All	6 13 4	120 to 121
400	20	Do., new shares	7 10 0	6 13 4	8½ to 9
170	10	Gillingham (Lim.) Dorset	10 0 0	3 0 0	
103	25	Glastonbury	25 0 0	4 0 0	15 0 0
600	10	*Glossop*	10 0 0	9 0 0	16 0 0
600	5	Do.	5 0 0	9 0 0	8 0 0
1800	10	Do., new shares	6 10 0	7 10 0	8 10 0
1000	25	*Gloucester*, A shares	25 0 0	10 0 0	42 0 0
856	25	Do., B shares	18 15 0	7 10 0	25 0 0
260	20	Godalming	20 0 0	5 0 0	20 0 0
300	5	Do., new shares	5 0 0	5 0 0	5 0 0
100	20	Do., do.	8 0 0		
100	5	Do., do.	2 0 0		
621	5	*Gomersal*	5 0 0	6 0 0	6 7 6
		Gorleston & Sthdn.			
855	25	*Gosport*	25 0 0	10 0 0	
450	20	Grantham	20 0 0	7 0 0	28 0 0
1000	20	*Gravesend*	20 0 0	5 0 0	21 0 0
		Grays Thurrock			
643	5	Gt. Berkhampstd.	5 0 0	6 0 0	5 10 0
1000	10	*Great Grimsby*	10 0 0	10 0 0	17 0 0
1000	6½	Do., new shares	4 10 0	10 0 0	8 2 6
700	5	Great Harwood	5 0 0	4 5 0	
280	5	Do., new shares	1 0 0		
210	10	Great Marlow	10 0 0	5 0 0	10 0 0
		Great Stanmore			
		Great Torrington			
450	5	Great Wigston	5 0 0	6 0 0	
150	1	Do., new shares	1 0 0	6 0 0	
1300	10	Guernsey	9 0 0	10 0 0	17 0 0
352	25	*Guildford*, A sh.	25 0 0		
352	3	Do., B shares	3 0 0		
		Do., new shares			
25	100	Guisborough	60 0 0	10 0 0	
		Hadleigh Cons.(L)			
240	5	Hadlow (Limited)	5 0 0		
140	10	Hailsham	10 0 0	6 0 0	10 0 0
40	50	Halesowen	50 0 0	6 0 0	
300	5	Halesworth	5 0 0	7 10 0	6 0 0
240	5	Haltwhistle (Lim.)	5 0 0	4 10 0	5 0 0
		Hampton			
1000	10	*Harrogate*	10 0 0	7 10 0	15 0 0
1000	3½	Do., new shares	3 6 8	7 10 0	5 0 0
900	10	Do., do.	8 0 0	7 10 0	9 10 0
6800	5	*Hartlepool Gas & Water*	5 0 0	7 0 0	6 17 6
3322	5	Do., new shares	5 0 0	7 0 0	6 17 6
9878	5	Do., do.	1 10 0	7 0 0	
1000	1	Hartley Wintney, Harwich	1 0 0	2 10 0	21s. to 23s.
662	6	*Haslingden*	6 0 0	10 0 0	10 0 0
343	6	Do., A shares	4 0 0	10 0 0	6 0 0
1840	25	*Hastings and St. Leonards*	25 0 0	9 0 0	
180	10	Hatfield			
		Harlow and Sawbridgeworth			
500	5	Havant	5 0 0	3 0 0	5 0 0
120	10	Haverhill	10 0 0	5 0 0	10 0 0
840	5	Hawick	5 0 0	10 0 0	8 12 6
244	5	Haworth	5 0 0		5 5 0
		Hay (L.), Brecon			
		Haydon Bridge			
6000	1	Hebden Bridge	1 0 0	9 0 0	1 10 0
170	10	Heckington (Lim.)	10 0 0		10 0 0
		Heckmondwike			
120	10	Hedon (Limited)	10 0 0	3 0 0	
145	12	Helston	12 0 0	9 0 0	
250	10	Hemel Hempstead	10 0 0	4 0 0	7 0 0
300	10	Henley (Limited)	10 0 0	6 0 0	10 0 0
		Hereford, £10,000		4 10 0	
300	10	Herne Bay	10 0 0	6 0 0	11 0 0
1300	10	*Hertford*	8 0 0	7 10 0	12 0 0
		Hessle (L.) £1500			
470	10	Hexham	10 0 0	8 0 0	14 0 0
400	25	*Heywood*	25 0 0	7 10 0	40 0 0
400	25	Do., new shares	25 0 0	7 10 0	37 10 0
400	25	Do., C shares	10 0 0	7 10 0	16 0 0
160	10	Higham Ferrers	10 0 0	7 0 0	12 0 0
		Highworth, Wilts.			
520	5	High Wycombe	5 0 0	6 0 0	6 16 0
300	10	Hinckley	10 0 0	7 10 0	10 0 0
600	5	Hindley, Lancash.	3 0 0		3 0 0
200	20	Hitchin	20 0 0	8 0 0	
200	5	Do., new shares	3 0 0	8 0 0	
		Hoddesden			
555	20	*Holmfirth*	19 0 0	5 0 0	19 0 0
960	5	Holyhead	5 0 0	6 0 0	6 2 6
		Holywell (*see* Brit. Provincial)			
98	25	Honiton	25 0 0	3 12 0	20 0 0
1250	1	Honley (Limited)	1 0 0	5 0 0	1 0 0
6	500	Horncastle	£500		
		Hornsey (Lim.)			
1200	2½	Horsforth	2 10 0		2 10 0
193	20	Horsham	20 0 0	10 0 0	26 0 0
	10	Houghton-le-Sprg.	10 0 0	8 0 0	
		Howden			
1700	20	*Huddersfield*	20 0 0	10 0 0	37 5 0
250	20	Do., new shares	15 0 0	10 0 0	
		Hull			
		Hull-Sculcoates (*see* Brit. Prov.)			
210	10	Hungerford	10 0 0	5 0 0	10 0 0
860	10	*Huntingdon*	10 0 0	9 0 0	16 10 0
140	10	Do., new shares	2 10 0	9 0 0	
		Hurstperpoint			
600	10	Huyton & Roby	10 0 0	7 0 0	
2500	10	*Hyde*	9 0 0	5 10 0	10 15 0
400	10	Hythe & Sandgate	10 0 0	6 0 0	10 15 0
		Idle & Eccleshill (*see* Airdale)			
		Ilford			
198	12	Ilfracombe	2 0 0	4 0 0	8 to 9
560	6½	Ilkestone	6 5 0	11 4 0	8 0 0
		Ilkley			
		Ilminster			
250	5	Ingatestone (Lim.)	5 0 0	1 10 0	
2800	10	*Ipswich*	10 0 0	10 0 0	18 0 0
1400	10	Do.	5 0 0	7 10 0	7 10 0
		Ironbridge			
180	10	Irthlingborough	10 0 0	7 0 0	10 0 0
800	30	*Isle of Thanet* (Margate & Ramsgate.)	39 0 0	10 0 0	60 0 0
		Jersey, St. Helier's			
363	5	Kelvedon (Lim.)	5 0 0		
1842	10	*Kendal United Gas and Water*	9 0 0	10 0 0	17 0 0
380	20	Do., preference	20 0 0	7 10 0	32 0 0
290	10	Kenilworth (Lim.)	10 0 0	4 0 0	10 0 0
400	5	Keswick	5 0 0	5 0 0	4 0 0
228	25	Kettering	25 0 0	6 10 0	30 0 0
		Ketton (L.) Rutld.		7 0 0	
		Keynsham			
		Kilworth, £2000			
		Kiddrmstr, £10,000		5 0 0	
806	5	Kidsgrove	5 0 0	12 0 0	7 10 0
150	10	Kimbolton	10 0 0	7 0 0	12 0 0
140	7	Kingsbridge	7 0 0		10 to 11
270	5	King's Cliffe	5 0 0	5 10 0	5 0 0
		Kingstn-on-Tham.			
		Kingswinford District, (Limited)			
		Kington, Hereford			
400	5	Kinver, Staffordsh.	5 0 0		5 0 0
		Kirby Lonsdale			
		Kirkburton			
400	5	Kirkby Stephen (L)	5 0 0		
330	5	Kirkham, Lanc.	5 0 0	4 0 0	5 0 0
330	2½	Do., new shares	2 10 0	4 0 0	2 0 0
200	10	Kirton-in-Lindsey	10 0 0	5 0 0	10 10 0
200	5	Knighton (L.)	5 0 0		
1000	10	*Knottingley*			
670	5	Knutsford Gas and Water (Limited)	5 0 0	8 0 0	5 10 0
319	5	Do.,	3 0 0	8 0 0	3 10 0
470	31½	*Lancaster*	31 10 0	7 2 10	48 0 0
470	9gs.	Do.	6 6 0	7 2 10	9 12 0
564	15⅞	Do.	15 15 0	7 2 10	24 0 0
50	25	Langport	25 0 0	4 0 0	15 0 0
		Launceston			
		Lea Bridge (*see* County & Gen)			
1500	20	*Leamington Priors*	20 0 0	10 0 0	30 0 0
250	20	Do., new shares	20 0 0	5 0 0	20 0 0
213	10	Leatherhead	10 0 0	5 0 0	10 0 0
		Ledbury			
		Leeds Company—Consolidated stk.	£100	6 0 0	113 to 114
6790	5	Do., new	1 0 0	6 0 0	1 12 6
		Leeds New Comp—Old stock	£100	10 0 0	179 to 180
45000*l*		New do.	£100	6 0 0	108 to 110
85000*l*		Do., B shares	5 0 0	6 0 0	¼ to ⅝ pm.
6500	5	Leeswood (Lim.)			
3900	13	*Leicester*	13 0 0	10 0 0	23 0 0
5000	10	Do., new shares	10 0 0	7 10 0	15 0 0
		Leigh		7 0 0	
470½	21	Leighton Buzzard	21 0 0	8 0 0	30 0 0
500	10	Leominster	10 0 0	5 0 0	9 10 0
330	25	Lewes, A shares	25 0 0	8 0 0	31 5 0
644	5	Do., B shares	5 0 0		6 5 0
245	5	Leyburn, Yorksh.	5 0 0		6 0 0
		Leyland, Lancash.			
250	20	Lichfield	20 0 0	10 0 0	40 0 0
320	25	*Lincoln*	25 0 0	10 0 0	70 0 0
306	5	Lindfield (Limited)	5 0 0	8 0 0	5 0 0
240	5	Liskeard	5 0 0	7 10 0	6 0 0
		Littleborough			
240	5	Littlehampton	5 0 0	10 0 0	5 0 0
	Sk.	*Liverpool United*	£100	10 0 0	208 to 210
	25	Do., ¼ share	25 0 0		52¼ to 52½
259	5	Llandovery (Lim.)	1 10 0	7 0 0	
1219	10	Llandudno Gas and Water	10 0 0	7 0 0	12 10 0
		Llanelly £3000			
		Llanfyllin(L) £2000			
		Llangollen			
250	10	Llanrwst(Limited)	9 15 0	5 0 0	9 15 0
262	5	Loddon	5 0 0	5 0 0	5 0 0
		Long Buckby (L.)			
120	10	Long Sutton(Lim.)	10 0 0	7 10 0	11 to 12
2000	5	Longton (Lim)	5 0 0	10 0 0	7 10 0
		Longwood, near Huddersfield			
250	5	Lostwithiel	5 0 0	4 0 0	6 0 0
250	1	Do., new shares	1 0 0	5 0 0	1 10 0
1422	6	Loughborough	6 0 0	10 0 0	11 15 0
240	25	*Louth*	25 0 0	10 0 0	35 0 0
2500	10	*Lowestoft G. & W.*			
611	5	Ludlow Union	5 0 0	5 0 0	5
250	5	Do., pref. shares	5 0 0	5 0 0	
640	10	*Luton*	10 0 0	7 10 0 & Bns.	12 0 0
640	5	Do., preferential	5 0 0	4 0 0	5 0 0
640	5	Do., new shares	5 0 0	7 10 0 & Bns.	6 0
100	20	Lutterworth	20 0 0	6 5 0	25 0 0
		Lydney (L.) £3000			
63	20	Lyme Regis	20 0 0	4 0 0	20 0 0
120	25	Lymington	25 0 0	5 0 0	25 0 0
		Lymm			
300	10	Maidenhead	10 0 0	5 0 0	10 0 0
500	25	*Maidstone*, A sh.	25 0 0	10 0 0	45 0 0
500	25	Do., B shares	25 0 0	4 0 0	20 0 0
	25	Do., new shares	25 0 0	7 10 0	
204	23	Maldon	23 0 0	7 0 0	27 0 0
200	10	Malmesbury	10 0 0	2 10 0	5 15 0
		Malpas (Limited)			
		Malvern Link			
		Manningtree			
		Mansfield £5000		10 0 0	
150	10	Mansfield Woodhse	10 0 0		
		March			
		Margate (*see* I. of Thanet)			
		Market Drayton			
132	25	Market Harboro'	25 0 0	7 0 0	35 0 0
		Market Weighton			
		Markyate St. (L.)			
		Marlborough			
150	10	Marsden(Lim.)	10 0 0	5 0 0	10 0 0
671	20	Maryport	14 0 0		14 5 0
600	5	Matlock (Lim)	5 0 0	6 0 0	
508	5	Matlock Bridge, Matlock Bank, & Matlk. Town (L.)	5 0 0	6 0 0	
200	2	Measham (Lim.)	1 12 6	5 0 0	
220	10	Melbourne	10 0 0	6 0 0	12 0 0
		Melksham			
934	2	Meltham	2 0 0	4 10 0	
		Melton Mowbray			
50	10	Mere	10 0 0		
		Merthyr Tydvil			
120	10	Middleham	10 0 0	5 0 0	10 0 0
3000	10	*Middleton*		10 0 0	
		Middleton-in-Teesdale			
400	5	Midhurst (Lim.)	5 0 0	2 10 0	5 0 0
		Midsmmr. Norton			
198	5	Mildenhall	5 0 0	5 0 0	
300	5	Milnthrpe(L.)£1500	4 10 0	3 6 8	
184	10	Milverton (Lim.)	10 0 0	5 0 0	10 0 0
2000	5	*Mirfield*	5 0 0	5 0 0	6 5 0
700	10	Mitcham	10 0 0	10 0 0	14 10 0
650	5	Mold Gas & Water	5 0 0	7 10 0	6½ to 6¾
700	10	Monmouth Gas & Water	10 0 0	5 0 0	10 0 0
250	5	Montgomery (L.)	5 0 0		
150	10	Moreton-in-Marsh	9 2 6	4 0 0	9 2 6
1000	5	*Morley*, nr. Leeds	5 0 0	10 0 0	8 10 0
1000	2	Do.	2 0 0	10 0 0	3 8 0
220	16	Morpeth	16 0 0	5 0 0	17 10 0
		Mossley			
		Mottram			
		Nayland			
		Neath			
185	10	Needham Market	10 0 0	4 0 0	
1000	5	Nelson (Limited)			
		Nethrthng(L.)£700			
		Newark £5000		10 0 0	
		Newburn			
250	20	Newbury	20 0 0	5 0 0	20 0 0
16000	8	*Newcstle & Gatshd. Nwcstle-un.-Lyne*	8 0 0	7 0 0	13 to 13½
250	5	Newent	5 0 0		
		Newhaven, Sussex			
		New Malton			
600	5	Newmarket	5 0 0	4 0 0	4 0 0
366	2	Do., preference	2 0 0	6 0 0	2 0 0
		New Mill (L.) £7000			
200	20	*New Mills & Hayfield*	15 10 0	5 0 0	
70	20	Newnham (Lim.)	20 0 0		21 0 0
		Newport Pagnell			
360	35	*Newport, Mon.*, A shares	35 0 0	9 0 0	50 0 0
540	35	Do., B shares	35 0 0	7 10 0	42 10 0
		Newport, Salop			
250	5	New Romney (Ld.)	5 0 0	5 0 0	5 0 0
		Newton Abbott			
198	10	Newtown, Mont.	10 0 0	6 0 0	10 0 0
		Northallerton			
777	20	*Northampton*, A shares	20 0 0	10 0 0	38 0 0
777	20	Do., B shares	20 0 0	4 0 0	14 0 0
777	20	Do., C shares	20 0 0	7 10 0	29 0 0
2331	5⅞	Do.	2 13 4	7 10 0	
		North Bierley			
		Northfleet (*see* Co. & General)			
		Northleach			
2914	5	North Shields	5 0 0	5 0 0	6 to 6½
120	10½	North Walsham	10 10 0	5 0 0	10 15 0
371	15	Northwich	15 0 0	5 0 0	15 0 0
		Norwich (*see* Brit. Provincial)			
4600	50	*Nottingham*	50 0 0	5 10 0	60 0 0
	50	Do., new shares	50 0 0	5 10 0	63 0 0
268	8	Nuneaton (Lim.)	8 0 0	5 0 0	7 10 0
125	8	Do., new shares	8 0 0	5 0 0	7 10 0
		Oaken Gates, Salop			
240	5	Oakhampton(Lim.)	5 0 0		
200	10	Odiham	10 0 0	5 0 0	10 0 0
320	5	Old Goole (Lim.)	5 0 0	6 0 0	5 0 0
		Olney			
360	10	*Ormskirk*, old sh.	10 0 0	8 0 0	14 0 0
1080	10	Do., new shares	4 10 0	8 0 0	6 4 6
2400	5	*Oswstt & Horbury*	5 0 0	8 0 0	9 0 0
		Oswestry			
		Otley, Yorkshire			
80	25	Oundle	25 0 0	7 0 0	25 0 0
600	15	*Over Darwen*, Original	15 0 0	5 0 0	19 0 0
600	15	Do., A shares	15 0 0	5 0 0	19 0 0
1200	15	Do., B shares	7 10 0	5 0 0	10 0 0
1694	1	Over & Whrtn. (L)	1 0 0		1 2 0
320	5	Owston Ferry (L.)	5 0 0	5 0 0	5 0 0
120	150	*Oxford*	£150	9 10 0	290 0 0
1527	5	Padiham	5 0 0	6 0 0	6 0 0
338	2½	Painswick	2 10 0		2 10 0
		Pangbourne (L)			
		Pately Br., Yorksh.			
300	5	Peel, Isle of Man	5 0 0	7 0 0	6 to 7

No. of Shares Issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Pembroke (*see* Co. and General)			
500	20	*Peniston*			
250	20	Penrith	15 0 0	6 10 0	21 0 0
153	20	Penzance	20 0 0		15 0 0
		Pershore			
320	5	Petersfield	5 0 0	5 0 0	
200	10	Petworth	10 0 0	9 17 6	18 6 8
100	10	Do., new shares	7 10 0	9 17 6	16 0 0
1200	2	Pewsey (Limited)	2 0 0	5 0 0	2 0 0
		Pickering			
2500	10	*Plymouth & Stonehouse*	10 0 0	10 0 0	19 0 0
2500	10	Do., new shares	10 0 0	7 10 0	14 0 0
2500	10	Do., new shares	3 0 0	7 10 0	4 10 0
160	10	Pocklington	10 0 0		5 0 0
		Ponder's End & Enfield Highway (Limited)			
		Pontefract			
		Pontypridd		4 0 0	
400	10	Poole	10 0 0	10 0 0	15 0 0
344	2	Do., new shares	2 0 0	10 0 0	3 0 0
643	5	Port Madoc (Lim.)	5 0 0	5 0 0	
		Port Talbot			
600	53	*Portsea Island*	53 0 0	8 0 0	60 0 0
600	50	Do., new shares	50 0 0	8 0 0	57 0 0
600	50	Do., new shares	49 0 0	8 0 0	56 0 0
9000	Sk.	Do.		5 0 0	92 0 0
120	10	Potton, Bedfordsh.	10 0 0	5 0 0	10 0 0
400	10	Prescott	10 0 0	5 0 0	
		Presteign			
120000	Sk.	*Preston*	All.	10 0 0	210 to 215
1000	10	Provincial (Hull)	8 0 0		8 0 0
600	20	*Pudsey*	20 0 0	7 10 0	30 0 0
600	6¾	Do., new shares	4 13 4	7 10 0	4 13 4
93	20	Pwllheli	20 0 0	2 10 0	25 0 0
600	5	Quorndon & Mountsorrel	5 0	7 0 0	12 0 0
900	10	*Radcliff & Pilkington*, No. 1	10 0 0		
2100	10	Do., No. 2	6 0 0		
200	20	Ramsay, I. of Man	20 0 0	6 10 0	23 0 0
		Ramsey, Hunts			
		Ramsgate (*see* I. of Thanet)			
		Rastrick			
		Rawmarsh			
20000	Sk.	*Reading*	100 0 0	8 0 0	120 5 0
5000	,,	Do.	100 0 0	5 0 0	100 10 0
1000	10	Do.	10 0 0	7 0 0	11 0 0
500	10	Do., preference	10 0 0	5 0 0	10 10 0
		Redbourn(L) £1100			
400	5	Redcar	5 0 0	4 0 0	5 0 0
1200	5	*Redhill*	5 0 0	6 0 0	5 5 0
		Redruth			
		Reigate			
1200	1	Repton (Limited)	1 0 0	5 0 0	1 1 0
2000	10	Richmond, Sry.(L)	10 0 0	7 0 0	15 0 0
600	5	Rhosllanerchrugog	3 0 0	7 10 0	5 0 0
		Rhymney (Lim.)			
400	5	Rickmansworth	5 0 0		5 0 0
180	10	Ringwood	10 0 0	5 0 0	10 0 0
180	33½	Ripon	33 10 0	4 10 0	
		Robin Hood's Bay (Limited)			
		Rochester & Chatham		6 0 0	
		Rochford			
2600	5	Romford	5 0 0	6 0 0	5 5 0
200	25	Romsey			
7500	Sk.	*Rotherham*, A stock	100 0 0	10 0	186 to 190
2500	Sk.	Do., B stock	100 0 0	8 0	152 to 154
600	20¾	Do., new shares	10 0 0	8 0 0	14¼ to 15
		Rothwell			
350	10	Royston	10 0 0	5 0 0	9 10 0
150	20	Rugby	20 0 0	10 0 0	
150	5	Do., ¼ shares	5 0 0	10 0 0	
150	6¾	Do., ¼ shares	6 13 4	10 0 0	
150	10	Do., new shares	10 0 0	10 0 0	
150	2½	Do., do.	2 10 0	10 0 0	
150	3½	Do., do.	3 6 8	10 0 0	
430	10	Rugely	10 0 0	5 0 0	10 10 0
		Runcorn		7 10 0	
114	31½	Ruthin	31 5 0	6 16 0	40 0 0
1000	10	Ryde	10 0 0	8 0 0	12 10 0
500	10	Do., new	5 0 0		7 10 0
500	5	Rye	5 0 0	6 0 0	6 0 0
		Saddleworth			
225	22	Saffron Walden	22 0 0	4 0	16 to 18
1400	5	St. Alban's Gas & Water (Lim.)	5 0 0	5 0 0	5 5 0
320	5	St. Asaph (Lim.)	5 0 0		
		St. Austell			
		St. Bees (Lim.)			
		St. Colomb			
3000	10	*St. Helen's*	10 0 0	10 0 0	18 10 0
		St. Ives, Cornwall			
		St. Mary's Cray			
400	25	*Salisbury*	25 0 0	6 0 0	28 0 0
341	10	Sandbach	10 0 0	5 0 0	12 10 0
		Sandown (Lim.)			
381	10	Sandwich	10 0 0	5 0 0	
		Sandy, Beds			
100	10	Saxmundham	10 0 0	5 0 0	
2000	10	*Scarborough*	10 0 0	7 0 0	13 0 0
1000	10	Do.	6 0 0	7 0 0	12 2 6
240	5	Sedburgh	5 0 0		
300	16	Selby	16 0 0	7 10 0	
140	5	Settle (Limited)	3 10 0	5 0 0	
290	10	Sevenoaks	10 0 0	4 0 0	10 0 0
300	10	Shaftesbury (Lim.)	10 0 0	5 0 0	8½ to 9
565	5	Sheepshed (Lim.)	5 0 0	6 0 0	6 0 0
135000	Sk.	*Sheffield United*, A stock	100 0 0	10 0	196 to 198
129984	Sk.	Do., B stock	100 0 0	10 0	196 to 197
2329	30	Do., C shares	10 10 0	8 0 0	33½ to 34
600	5	Shefford (Limited)	4 0 0		
		Shelton, Potteries (*see* Brit. Prov.)			

No. of Shares Issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
2182	5	Sheppy, Sheerness	5 0 0	10 0 0	7 0 0
18	5	Do., pref. sh.	5 0 0	5 0 0	
800	5	Do., pref. sh.	5 0 0	4 0 0	
350	10	Shepton Mallet	10 0 0	7 10 0	10 0 0
1000	5	Sherborne	5 0 0	7 10 0	5 0 0
		Shiffnal, Salop			
1000	5	*Shipley*	5 0 0	6 0 0	7 10 0
150	10	Shipston-on-Stour	10 0 0	4 0 0	
		Shirley & Freemantle, Hants			
240	25	Shotley Br. (Lim.)	25 0 0	7 0 0	19 0 0
240	10	Do., new shares	10 0 0	7 0 0	8 0 0
1000	10	*Shrewsbury*, A shares	10 0 0	10 0 0	20 0 0
1000	10	Do., B shares	10 0 0	5 0 0	10 0 0
1000	10	Do., new shares	10 0 0	7 10 0	15 0 0
		Sible Hedingham			
7000	Sk.	*Skipton*	100 0 0	9 0 0	150 0 0
400	2½	Do., new shares	2 10 0	5 0 0	3 0 0
		Slaithwaite			
250	20	Sleaford	20 0 0	5 0 0	20 0 0
250	10	Slough	10 0 0		
340	5	Snaith	5 0 0		4 0 0
		Soham			
150	10	Somerton	10 0 0		
354	5	Southam	5 0 0		
1000	50	*Southampton*	50 0 0	10 0 0	
		Southborough			
		Southend, Essex			
220	10	South Molton	10 0 0	5 10 0	7 10 0
		South Petherton (L)			
2000	10	*South Shields*	10 0 0	9 0 0	14 2 6
248	10	Southwell (Lim.)	10 0 0	5 0 0	11 to 11½
300	5	Southwold	5 0 0	5 0 0	5 0 0
1470	1	Spennymoor(Lim.)	1 0 0		
400	5	Spilsby	5 0 0		
		Spittal, Berwick-on-Tweed			
2000	6⅔	*Stafford*	6 13 4	10 0 0	10 0 0
2000	6⅔	Do., new shares	4 0 0	8 0 0	5 0 0
178	5	Staindrop	5 0 0	6 0 0	5 0 0
248	25	Staines & Egham	25 0 0	6 0 0	26 to 27
		Staley Bridge		10 0 0	
225	50	*Stamford & St. Martin's*	50 0 0	9 0 0	75 0 0
150	10	Staveley (Limited)	10 0 0	5 0 0	11 10 0
300	5	Stevenage	5 0 0	5 0 0	5 0 0
2500	10	*Stoke, Fenton & Longton*	10 0 0	10 0 0	
500	10	Do.,	2 0 0	10 0 0	
400	5	Stone, Stafford	5 0 0	5 0 0	6 0 0
220	10	Stoney Stratford	10 0 0	4 10 0	9 0 0
		Storrngtn(L) £1000			
		Stourbridge, £5000			
		Stow-on-the-Wold			
150	20	*Stratford-on-Avon*	20 0 0	10 0 0	40 0 0
150	5	Do., new shares	5 0 0	10 0 0	10 0 0
375	8	Do., preference	8 0 0	5 10 0	8 10 0
750	5	*Stretford*	5 0 0	9 0 0	5 0 0
		Stroud			
261	20	Sudbury	20 0 0	5 0 0	20 0 0
		Sunbury (L), Mid.			
18120	5	*Sunderland*	5 0 0	8 10 0	8 10 0
4000	5	Do., new shares	5 0 0	8 10 0	8 5 0
200	10	Sutton Coldfield(L)	10 0 0		10 0 0
350	10	Sutton-in-Ashfield	10 0 0	7 10 0	12 10 0
		Sutton Southcoates & Drypool, Hull	20 0 0		23 to 24
		Sutton, Surrey			
600	5	Swadlincote	5 0 0	5 0 0	5 0 0
169	10	Swaffham	10 0 0	5 0 0	7 0 0
240	25	*Swansea*	25 0 0	10 0 0	47 to 48
1280	25	Do., new shares	25 0 0	7 10 0	34 0 0
		Swindon			
		Swindon New (L.)			
200	10	Swineshead (Lim.)	10 0 0	5 0 0	10 5 0
1000	5	Swinton & Mexboro'	5 0 0	7 0 0	7 0 0
		Syston	10 0 0		10 0 0
180	10	Tadcaster	5 0 0	5 0 0	3 0 0
276	5	Tamworth			
		Taporley (Lim.)			
		Tattershall & Coningsby (Lim.)			
		Taunton	5 0 0	6 0 0	6 0 0
2800	5	Do., new shares	1 10 0	6 0 0	
2800	1½	Tavistock	3 3 9	6 0 0	5 10 0
800	6¾	Tenbury Union	5 0 0	5 0 0	5½ to 6
200	5	Tenterden	10 0 0	4 0 0	8 0 0
150	10	Tetbury, Gloster	9 0 0	5 0 0	
200	10	Tewkesbury			
200	10	Thame	10 0 0	5 0 0	10 0 0
250	10	Thetford	10 0 0	6 0 0	10 to 11
150	10	Thornbury (Lim.)	10 0 0	4 0 0	
80	1	Do., new shares	1 0 0	4 0 0	
356	5	Thorne	5 0 0		4 0 0
160	10	Thrapston (Lim.)	10 0 0	5 0 0	10 0 0
		Tideswell(L.) £2000			
1885	5	Todmorden (Lim.)	5 0 0	7 10 0	7 10 0
1870	5	Do., B shares	3 0 0	7 10 0	4 10 0
600	2½	Topsham (Lim.)	2 10	5 0 0	
		Torpoint (Lim.)			
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes Consumers			
5000	5	*Tottenham & Edmonton*	5 0 0	8 0 0	6 0 0
150	10	Towcester	10 0 0	5 0 0	10 0 0
		Town-Malling			
300	5	Towyn(L) Merion.	4 0 0		4 0 0
275	10	Tring	10 0 0	5 0 0	10 0 0
		Trowbridge (*see* Brit. Provincial)			
320	25	Truro	25 0 0	10 0 0	
		Tunbridge			
2000	10	*Tunbridge Wells*	10 0 0	10 0 0	19 0 0
100	10	Tuxford	10 0 0	5 0 0	12 0 0
		Twyford (Limited)			
		Ulverston			
		Uppingham			

No. of Shares Issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
240	5	Upton-on-Severn	5 0 0	5 0 0	5 0 0
309	5	Usk (Limited)	5 0 0	8 0 0	6 12 6
250	10	Uttoxeter	10 0 0	5 0 0	13 0 0
		Uxbridge			
		Ventnor			
160	10	Wainfleet (Lim.)	10 0 0		8 0 0
1000	25	*Wakefield*	25 0 0	10 0 0	44 0 0
3660	5	Do.,	5 0 0	10 0 0	8 16 0
1732	5	Do., new shares	5 0 0	7 10 0	6 15 0
		Walker & St. Anthony (L.) £2000			
300	10	Wallingford	10 0 0	5 0 0	8 0 0
		Walton-on-Tham (*see* Co. & Gen.)			
200	10	Wantage	9 0 0	5 0 0	10 10 0
		Ware (*see* C. & G.)			
100	10	Wareham	10 0 0	3 10 0	8 0 0
2000	1	Warkwth & Amble	1 0 0	3 10 0	
200	25	Warminster	25 0 0	6 0 0	28 0 0
900	20	*Warrington*	20 0 0	10 0 0	39 to 39½
900	20	Do., new shares	15 0 0	10 0 0	29 0 0
		Warth			
		Warwick. £15,000		6 0 0	
		Watford			
400	10	Weedon (Limited)	10 0 0	6 10 0	12 10 0
400	3	Do., new shares	1 10 0	6 10 0	1 17 6
111	25	Welchpool, Montg.	25 0 0	5 0 0	25 0 0
200	25	Wellingborough	25 0 0	5 0 0	25 0 0
450	10	Wellington, Salop	10 0 0	7 10 0	12 10 0
		Wellington, Som.			
160	25	*Wells*, Somerset	25 0 0	10 0 0	
		Wem (Lim.) £2000			
		W. Auckld. & St. Helen's, Auckld (L)			
160	10	Westbury	10 0 0		
		West Cowes			
225	10	Westerham (Lim.)	10 0 0	5 0 0	11 0 0
454	5	West Malling Gas and Water	5 0 0	3 0 0	4 10 0
200	20	*Weston-sup.-Mare* A shares	20 0 0	10 0 0	30 0 0
200	20	Do., B shares	20 0 0	7 10 0	20 0 0
800	20	Do., C shares	6 0 0	7 10 0	
200	5	Wetherby	5 0 0		1 10 0
2000	10	*Weymouth*			
		Whaley Bridge			
2300	1	Whitchurch, Hants	0 10 0	2 10 0	
400	25	Whitehaven	25 0 0	2 0 0	14½ to 15
		Whitehaven New			
		Whitstable			
		Whittington			
250	10	Whittlesea	10 0 0	5 0 0	11 0 0
300	10	Whitwick & Coalville	10 0 0		10 0 0
1200	5	*Whitworth Vale*	5 0 0	4 0 0	7 0 0
1200	5	Do., new shares	4 7 6	4 0 0	6 7 6
		Widnes Gas & Wtr.			
1250	10	*Wigan*	10 0 0	10 0 0	20 0 0
1250	10	Do., preference	10 0 0	5 0 0	10 0 0
2500	10	Do., new shares	5 0 0	7 10 0	8 15 0
400	5	Wigston	5 0 0	6 0 0	5 0 0
		Wigton, Cumberd.			
1020	5	*Willenhall*, A shares	5 0 0		
1020	54s.	Do., B shares	2 14 0	5 0 0	
		Do., new shares			
		Wilton			
600	10	Wimbledon	8 0 0		8 0 0
240	10	Wimborne Minster	10 0 0		
130	10	Wincanton	10 0 0	7 0 0	
		Winchcombe £1500			
		Winchester G. & W.			
		Windermere Dist.			
1200	20	Windsor (Limited)	20 0 0	6 5 0	23 0 0
141	10	Winslow	10 0 0	6 0 0	10 0 0
120	10	Winterton (Lim.)	10 0 0	5 0 0	
120	5	Do., new shares	5 0 0	5 0 0	
200	10	Wirksworth	10 0 0	5 0 0	10 0 0
		Wisbeach			
		Witham			
		Witney			
400	5	Wivelscombe (L.)	5 0 0	6 0 0	5 5 0
		Wivenhoe (L.) £2000			
200	10	Woburn	10 0 0	5 0 0	11 0 0
210	10	Wokingham	10 0 0	5 0 0	
54480	Sk.	*Wolverhampton*		10 0 0	195 0 0
4448	10	Do., new shares	7 10 0	10 0 0	14 0 0
550	10	Woodbridge (Lim.)	10 0 0	8 0 0	
660	2½	Woodstock	2 10 0	5 0 0	
		Woodhouses			
200	7	Wooler	7 0 0		
2400	5	*Woolwich Consrs.*	5 0 0	10 0 0	8 0 0
2400	5	Do., do.	5 0 0	7 10 0	7 0 0
4800	5	Do., do.	3 0 0	7 10 0	4 0 0
		Woolwh. Equitable			
		Wootton Bassett			
2400	10	*Worcester*	10 0 0	10 0 0	14 7 6
		Workington			
600	10	*Worksop*	10 0 0	5 0 0	
600	5	Do., new shares	5 0 0	5 0 0	
		Worthing			
		Worsboroughdale & Worsboro.			
270	12	Wotton-un.-Edge	12 0 0	4 0 0	7 0 0
600	5	Wrexham, A sh.	5 0 0	7 10 0	5 0 0
600	5	Do., B shares	5 0 0	5 0 0	5 0 0
600	5	Do., C shares	3 10 0	5 0 0	3 10 0
		Writtle			
		Wye, Kent			
		Wylam			
400	5	Wymondham	5 0 0	6 10 0	5 0 0
		Yarmouth, I. of W.			
800	30	*Yarmouth, Norfk.*	30 0 0	7 10 0	
800	7½	Do., ¼ shares	7 10 0	7 10 0	
1675	4	Yeadon & Guiseley	4 0 0	5 0 0	4 8 0
1675	2	Do., new shares	0 5 0	5 0 0	0 5 6
140	30	Yeovil	30 0 0	6 0 0	30 0 0
140	10	Do., new shares	10 0 0	6 0 0	10 0 0
		York Town			
15000	10	*York United*	5 0 0	10 0 0	10 15 0
		Yoxford			

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share	Div. per Cent. per Annum.	Price per Share.
	£	**SCOTLAND.**	£ s d	£ s d	£ s d
26000	2½	Aberdeen	2 10 0	10 0 0	5 1 0
		Abernethy			
		Aberlour(L.) £650			
500	10	Airdrie	10 0 0	9 0 0	14 10 0
		Alloa			
		Alva, nr. Stirling			
		Alyth			
600	5	Annan	5 0 0	5 0 0	5 0 0
1600	1	Anstruther & Cellardyke	1 0 0	8 0 0	1 6 0
825	20	Arbroath	20 0 0	7 10 0	30 0 0
100	20	Ardrossan	20 0 0	5 0 0	20 0 0
658	1	Auchinleck	1 0 0		
381	5	Auchterarder	5 0 0	7 10 0	7 10 0
750	2	Auchtermuchty	2 0 0	6 0 0	2 10 0
2932	5	Ayr	5 0 0	6 0 0	5 16 0
4250	2	Ayr&NewtonCons.	2 0 0	6 0 0	2 2 0
300	10	Banff	10 0 0	6 0 0	11 0 0
2158	1	Barrhead	1 0 0	7 10 0	1 0 0
200	5	Bathgate	5 0 0	5 0 0	5 0 0
		Beith			
976	1	Bervie	1 0 0	5 0 0	
		Biggar			
739	5	Blairgowrie	5 0 0	8 0 0	7 0 0
		Blantyre (Lim.)			
400	6	Borrowstowness	6 0 0	5 0 0	6 0 0
540	5	Brechin	5 0 0	10 0 0	11 0 0
		Bridge of Allan			
4175	2	Broughty Ferry	2 0 0	4 0 0	2 4 0
		Callender			
		Campbelton			
250	4	Carluke, Lanark	4 0 0	7 10 0	4 0 0
178	5	Castle Douglas	5 0 0	5 0 0	5 0 0
2330	3	Coatbridge	3 0 0	10 0 0	5 0 0
200	5	Coldstream	5 0 0	6 0 0	5 0 0
		Collinsburgh			
1000	1	Comrie	1 14 8	4 10 0	1 14 8
		Corstorphine			
1200	1	Crail, Fife	1 0 0	5 0 0	1 0 0
2744	1	Crieff	1 0 0	10 0 0	1 15 0
600	1	Cullen	1 0 0	5 0 0	0 15 0
280	2½	Cumbernauld	2 10 0	5 0 0	2 10 0
200	5	Cumnock	5 0 0	6 0 0	6 0 0
600	5	Cupar Angus	5 0 0	7 0 0	6 10 0
250	10	Cupar Fife	10 0 0	10 0 0	18 10 0
300	10	Dalkeith	10 0 0	10 0 0	20 0 0
		Deanston			
750	2	Denny	2 0 0	6 5 0	2 5 0
		Denny Consumers			
	5	Dornoch			
500	1	Douglas	1 0 0	6 0 0	1 2 0
		Dufftown			
		Dumbarton			
400	20	Dumfries	14 0 0	7 2 10	14 10 0
391	5	Dunbar	5 0 0	6 0 0	5 10 0
		Dunblane			
1250	23⅓	*Dundee*	23 15 0	8 15 9	54 0 0
8000	5	*Dundee, New*	5 0 0	5 0 0	5 15 0
860	10	Dunfermline	10 0 0	10 0 0	16 10 0
		Dunkeld			
1750	2	Dunoon	2 0 0	6 0 0	2 3 0
		Dunse			
250	5	Dysart	5 0 0	7 10 0	6 10 0
2327	1	East Wemyss	1 0 0	6 0 0	1 2 0
750	1	Ecclefechan	1 0 0		
6000	25	*Edinburgh*	25 0 0	10 0 0	51 17 6
6400	2 5	*Edinburgh & Leith*	25 0 0	8 0 0	50 0 0
621	12	Elgin	12 0 0	6 0 0	13 0 0
1300	1	Elie & Earlsferry	1 0 0	7 5 0	1 3 0
		Ellon			
		Errol			
		Eyemouth			
	14	Falkirk	14 0 0	7 0 0	14 0 0
		Falkirk, New			
632	2	Falkland	2 0 0	5 0 0	2 0 0
		Fettercairn			
2000	1	Ferry Porton Craig	1 0 0	6 5 0	1 3 0
581	1	Fochabers	1 0 0	5 0 0	1 2 0
1440	5	Forfar	5 0 0	7 10 0	7 12 6
360	5	Do., new shares	2 10 0	7 10 0	6 10 0
		Fort William			
2000	1	Fraserburgh	0 16 0	5 0 0	0 18 0
500	5	Galashiels	5 0 0	10 0 0	9 10 0
		Gatehouse, n. Fleet			
900	2½	Girvan	2 10 0	6 0 0	2 10 0
5200	25	*Glasgow*	25 0 0	10 0 0	50 0 0
3200	6¼	Do., ¼ shares	6 5 0	10 0 0	12 10 0
1000	25	Do., new shares	25 0 0	7 10 0	38 0 0
15000	10	*Glasgow City and Suburban*	10 0 0	10 0 0	20 0 0
5000	10	Do., new shares	10 0 0	7 10 0	15 0 0
		Grahamston			
190	10	Grangemouth	10 0 0	5 0 0	10 0 0
400	8½	Haddington	8 5 0	7 10 0	11 10 0
		Hamilton			
	5	*Hamilton, New*	5 0 0	4 10 0	6 0 0

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
300	5	Helensburgh	5 0 0	7 10 0	7 10 0
2000	2	Holywood (Lim.)	2 0 0	7 10 0	3 0 0
1312	1	Huntly	1 0 0	7 10 0	1 5 0
250	5	Inverary	5 0 0	10 0 0	6 12 6
425	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness G. & Wr.*	10 0 0	7 10 0	13 10 0
2400	5	Do., new shares	3 15 0	7 10 0	5 0 0
		Inverury			
	10	Irvine	10 0 0	10 0 0	14 0 0
	2½	Do.	2 10 0	10 0 0	3 12 6
300	5	Jedburgh	5 0 0	7 10 0	7 10 0
		Johnstone, Paisley			
		Kelso			
1300	1	Keith	1 0 0	5 0 0	0 11 0
600	5	Kelso	5 0 0	10 0 0	11 0 0
620	2	Kelsyth	2 0 0	5 0 0	2 0 0
950	1	Kennoway	1 0 0	5 0 0	1 1 0
1515	1	Kettle Freuchie & Kettle Bridge	1 0 0	5 0 0	5 0 0
600	25	Kilmarnock	25 0 0	7 10 0	30 0 0
600	25	Do., new shares	7 10 0	7 10 0	
334	5	Kincardine	5 0 0	5 0 0	4 10 0
		Kinghorn			
		Kingskettle, Fife			
		Kinross			
1200	5	Kirkcaldy	5 0 0	10 0 0	10 10 0
320	5	Kircudbright	5 0 0	5 0 0	5 0 0
997	3	Kirkintulloch	3 0 0	6 13 4	3 7 0
		Kirkwall			
		Kirriemuir			
		Lanark			
3500	1	Lanark Conrs. (L.)	1 0 0	7 10 0	1 2 6
		Largo, near Leven			
280	8	Largs	8 0 0	7 10 0	8 10 0
1309	1	Lasswade	1 0 0		
177	5	Lauder	5 0 0	5 0 0	5 0 0
2000	1	Leslie, Fife	1 0 0	7 10 0	1 5 0
618	1	Lesmahago	1 0 0	6 0 0	1 0 0
		Leuchars			
877	5	Leven	5 0 0	10 0 0	7 10 0
100	10	Linlithgow	10 0 0	10 0 0	19 0 0
		Linton			
		Lochee, n. Dundee			
434	5	Lochgilphead(Ld.)	5 0 0	7 0 0	5 10 0
380	5	Lochwinnock	5 0 0	3 10 0	4 0 0
		Macduff			
1200	1	Markinch, Paisley	1 0 0	8 0 0	1 5 0
		Maryhill, n.Glasg.			
282	3	Mauchline	3 0 0	5 0 0	3 0 0
667	5	Maxwll T. & Dumf.	5 0 0	5 0 0	3 to 3½
423	5	Maybole, Ayrshire	5 0 0	4 10 0	5 0 0
		Meigle (L.) £700			
373	2	Melrose	2 0 0	7 10 0	2 10 0
718	2	Mid & East Calder	2 0 0		2 0 0
200	5	Moffat	5 0 0	5 0 0	
120	2½	Do., new shares	2 10 0	5 0 0	
400	20	Montrose	20 0 0	10 0 0	35 0 0
		Muirkirk (L.) £1000			
1000	5	Musselburgh	5 0 0	8 0 0	9 0 0
618	1	Nairn	1 0 0	5 0 0	1 0 0
		Neilston, n. Glasg.			
300	5	Newburgh, Fife	5 0 0	8 0 0	7 0 0
300	1	Do., new shares	1 0 0	8 0 0	
1200	1	Newmilns	1 0 0	7 10 0	1 2 0
		Newport, n. Dundee			
1300	1	Newport, Fife	1 0 0	5 0 0	1 0 0
		Newton-on-Ayre			
107	14½	Newton Stewart	14 10 0	5 0 0	14 10 0
300	5	N. Berwick, N.B.	5 0 0	5 0 0	7 10 0
		N. Queensferry			
245	5	Oban	5 0 0	7 10 0	5 7 6
1000	5	Peebles	5 0 0	6 0 0	5 0 0
500	2½	Do., new shares	2 10 0	6 0 0	2 10 0
1000	25	Perth	25 0 0	5 0 0	25 0 0
3000	5	Perth, New	5 0 0		0 3 0
		Peterhead			
2000	1	Pettenween	1 0 0	6 0 0	1 1 0
2416	1	Pollokshaws	1 0 0	7 10 0	1 5 0
		Port Glasgow			
		Portobello			
		Portsoy			
200	5	Prestonpans	5 0 0	6 0 0	
1594	1	Renton, Dumbrtn.	1 0 0	7 10 0	1 1 6
		Rothes			
1500	1½	Rutherglen	1 6 8	5 0 0	1 6 8
250	12	St. Andrew's	12 0 0	8 6 8	16 10 0
193	12	Do., new shares	12 0 0	8 6 8	16 10 0
400	5	Saltcoats	5 0 0	7 10 0	6 0 0
936	1	Sanquhar	1 0 0	5 0 0	0 15 0
30	1	Do., preference	1 0 0	5 0 0	
400		Selkirk	5 0 0	10 0 0	10 0 0
508	1	South Queensferry	1 0 0	5 0 0	1 0 0
200	5	Stewarton	5 0 0	10 0 0	6 to 6½
7450	2	Stirling	2 0 0	8 0 0	3 5 0
2500	1	Stonehaven	1 0 0	6 5 0	1 5 0
1110	1	Stonehouse	1 0 0	7 10 0	13s. to 15s.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
600	2½	Stornoway	2 10 0	8 0 0	3 10 0
		Stow (Limited)			
500	5	Stranraer	5 0 0	10 0 0	6 13 6
588	2	Strathaven	2 0 0	8 0 0	3 0 0
643	2½	Thurso	2 10 0		2 10 0
		Tillicoultry			
		Turriff			
800	1	Tranent	1 0 0	5 0 0	1 0 0
		Troon			
		Tullibody			
2051	1	Wemyss & Bkhn.	1 0 0	6 0 0	1 0 0
		Wick			
665	5	Wigtown	5 0 0		
		IRELAND.			
1800	1	Antrim (Limited)	1 0 0		1 0 0
		Ardee			
300	10	Armagh (Lim.)	10 0 0	10 0 0	20 2 6
500	5	Athy (Limited)	4 0 0	6 0 0	5 0 0
		Balbriggan £1400			
		Ballycastle			
900	6	Ballymena & Harryville (L.)	6 0 0	8 0 0	6 10 0
184	10	Ballymoney	10 0 0	5 0 0	10 0 0
220	5	Ballynahinch(Ld.)	5 0 0	5 0 0	5 0 0
		Ballyshannon £2000			
		Bangor, Down			
5250	20	*Belfast*	20 0 0	10 0 0	39 0 0
2450	20	Do., new shares	20 0 0	10 0 0	35 to 37
		Boyle (Limited)			
1047	5	Carlow	5 0 0	5 0 0	5 0 0
600	5	Carrickfergus(Ld.	5 0 0	8 0 0	6 5 0
197	10	Carrickmacross(L.)	10 0 0	5 0 0	10 0 0
300	10	Carrick-on-Suir	10 0 0	6 0 0	10 0 0
228	10	Castleblaney (Ld.)	10 0 0	5 0 0	10 0 0
400	5	Cavan (Limited)	5 0 0		5 0 0
		Clones (L.) £2000			
2000	5	Clonmel Consmrs.	5 0 0	6 0 0	5 0 0
240	5	Comber (Limited)	5 0 0	5 0 0	5 0 0
500	5	Cookstown	5 0 0	5 0 0	
		Coote Hill			
12000	5	Cork Conrs.(Lim.)	5 0 0	8 0 0	7 15 0
6000	5	Do., new shares	4 0 0	8 0 0	6 10 0
		Donaghadee £2000			
608	11	Drogheda	11 0 0	7 0 0	14 10 0
420	5½	Do., new shares	5 10 0	7 0 0	7 5 0
		Dub.Hib.(*see* U.G.)			
19000	10	*Dublin Alliance*	8 0 0	8 15 0	11 10 0
440	25	Dundalk (Limited)	25 0 0	8 0 0	25 0 0
456	10	Dundrum(Limited)	6 0 0	5 0 0	6 0 0
600	5	Dungannon	5 0 0	5 0 0	6 0 0
871	5	*Downpatrick*	5 0 0	4 0 0	4 0 0
249	10	Ennis (Limited)	10 0 0		11 0 0
240	25	Galway	25 0 0	10 0 0	35 0 0
		Gorey (L.) £2000			
		Holywood (Lim.)			
		Keady			
600	5	Kells (L.) Meath	5 0 0	6 0 0	5 0 0
600	10	Kilkenny (Limited)	10 0 0	8 0 0	12 0 0
		Killarney (L.) £3000			
		Kilrush			
		Kinsale (L.) £2000			
210	10	Larne (Limited)	10 0 0	5 0 0	10 0 0
150	10	Letterkenny (Ld.)	10 0 0	5 0 0	12 10 0
		Limerick (*see* U.G.)			
500	10	Lisburn (Limited)	10 0 0	10 0 0	14 0 0
300	5	Lismore	5 0 0	3 0 0	
100	5	Do., preference	3 0 0	5 0 0	
600	15	Londonderry	15 0 0	6 13 4	21 0 0
		Longford			
540	10	Lurgan	8 0 0	6 0 0	9 0 0
		Mallow			
2191	1	Maryborough(Ld.)	0 5 0		0 5 0
		Midleton			
770	5	Monaghan (Lim.)	5 0 0	4 10 0	5 16 0
2000	10	Navan	5 0 0	6 0 0	4 0 0
		Nenagh			
1400	5	Newry Conrs. (L.)	5 0 0	10 0 0	8 3 0
450	5	Newtownards	5 0 0	7 0 0	6 5 0
200	10	Newtownlimavady	10 0 0	5 0 0	10 0 0
		Omagh	5 0 0	7 10 0	6 0 0
500	5	Portadown	20 0 0	5 0 0	21 0 6
125	20	Portaferry			
500	10	Queenstown	10 0 0	6 0 0	10 0 0
200	10	Do., new shares	5 0 0	6 0 0	5 0 6
		Roscommon £2500			
		Saintfield(L.) £1000			
600	10	Sligo	10 0 0	8 0 0	12 10 0
600	5	Do., new shares	5 0 0	8 0 0	6 5 0
		Tandragee (Lim.)			
		Tuam (L.) £3000			
540	5	Tullamore	5 0 0	6 0 0	5 0 0
240	5	Tullow	5 0 0		5 0 0
		Warrenpoint £3000			
1600	10	*Waterford*	10 0 0	6 0 0	12 0 0
300	10	Wicklow (Lim.)	10 0 0	6 0 0	10 0 0

The Gas-Works in the undermentioned towns belong to private individuals. Those marked * by the purchase of the shares in extinct companies:—

Aldershot. Alford. Ballina. Barking*. Beaufort (Brecon). Beaumaris. Berkeley. Billericay. Bodmin. Broadbottom. Brynmawr. Bungay. Burntisland. Chapel-en-le-Frith. Chard. Clare, Suffolk. Crewe. Crickhowell. Dingwall. Eccleshill, near Leeds. Ellesmere. Enniscorthy. Falmouth. Farsley. Fermoy. Ferry Hill. Fleetwood. Goole. Hadleigh. Halstead. Harleston. Harrow-on-the-Hayle. [Hill. Holbeach. Holt. Hunmanby. King's Langley. Leiston (Suffolk). Lynn. Market Deeping. Milnrow, nr. Manchester. Mold Green, nr. Huddersfield. Nantwich*. Nettlebed. Newport (I. of W.) New Ross. Oakham*. Parsonstown. Penryn. Peterborough. Pontypool. Redditch. Ross. Rhyl. St. Blazey (Cornwall). St. Ives*(Hunts). St. Neots*. Seaham. Sidmouth. Sittingbourne. Southall, Midlsex. Stokesley. Stowmarket. Thirsk. Tipperary. Tiverton*. Waltham Abbey. Wem. Wexford. Whitby*. Whitchurch(Salop). Willington Quay & Howdon.

The Gas-Works belong to Local Boards or to Municipal Corporations, or to Commissioners acting under special Acts of Parliament, in the following towns:—

Abergavenny. Athlone. Ballinasloe. Bethesda, Bangor. Beverley. Birkenhead. Blackpool. Bollington (Cheshire). Brighouse. Burnley. Burton-on-Trent. Bury (Lanc.). Carlisle. Cashel. Coleraine. Dalton. Darlington. Devizes. Doncaster. Enniskillen. Great Malvern. Greenock. Halifax. Haverfordwest. Keighley. Knaresborough. Layton with Warbrick (Lanc.) Leek. Limerick Corporation Works. Lytham (Lanc.). Macclesfield. Manchester. Middlesborough. Milton (Kent). Newton (Lanc.) Oldham. Paisley. Renfrew. Richmond(Yorks.) Ripon. Rochdale. Rothesay. Salford. Southport. Sowerby Bridge. Spalding. Stockport. Stockton-on-Tees. Strabane. Teignmouth. Tenby. Tralee. Trim (Meath). Tyldesley & Shakerley. Wallasey. Walsall. Wells (Norfolk) Workington. Youghall.

Share List of Water Companies.

See "Share List of Gas Companies" for Gas and Water Companies.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
		Airdrie & Coatbrdg	£ s d	£ s d	£ s d
588	1	Alexandria, Dumb	1 0 0		0 2 6
800	25	Ayr	25 0 0	5 0 0	25 0 0
1460	10	Banbury	10 0 0	3 10 0	9 0 0
		Belper			
9600	25	Birmingham	25 0 0	6 10 0	34 0 0
9600	17½	Do., new shares	3 0 0	6 10 0	
6000	10	Blackburn	10 0 0		
		Boston			
		Br. of Earn(L)£450			
		Brighton, Hove, &			
8000	25	Bristol . [Preston	25 0 0	3 2 0	20 to 21
8000	12½	Do., preference	12 10 0	5 0 0	13 2 6
		Broadstairs		4 0 0	
		Brompton and Gillingham			
5000	10	Bury and Radcliffe	10 0 0	2 0 0	10 0 0
1333	15	Do., pref. shares.	15 0 0	10 0 0	31 15 0
1333	18	Do., do.	6 0 0	10 0 0	14 0 0
2000	10	Do., do.	5 0 0	4 0 0	5 0 0
2000	10	Do., do.	1 0 0	4 0 0	5 0 0
2500	10	Cambridge	10 0 0	4 10 0	
2500	3	Do.	3 0 0	4 10 0	
1500	20	Cardiff	20 0 0	7 10 0	24 to 25
1500	10	Do.	10 0 0	7 10 0	14½ to 15
	10	Carlisle	10 0 0		13 to 14
55625	Sk.	Cheltenham	100 0 0	5 5 0	120 0 0
687¼	25	Do., pref. shares.	25 0 0	4 10 0	25 0 0
		Chepstow			
		Chester			
2485	2	Clay Cross	2 0 0	8 0 0	2 16 0
		Colchester			
175	20	Colne, Lancashire.	20 0 0	5 0 0	28 0 0
		Consett District.			
		Dartford			
1250	20	Darwen	20 0 0	2 10 0	19 to 19½
1400	5	Deal	5 0 0	7 0 0	6 0 0
1511	25	Derby	25 0 0	9 0 0	53 0 0
400	50	Dudley	50 0 0	1 0 0	20 0 0
250	25	Do., pref. shares	25 0 0	4 10 0	
		Dukinfield			
11600	10	Dundee	10 0 0	5 0 0	11 0 0
2670	5	Dunfermline	5 0 0	2 0 0	2 10 0
	5	Durham	5 0 0		
7360	25	Edinburgh	25 0 0	5 0 0	28 0 0
7360	12½	Do., new shares.	12 10 0	5 10 0	16 0 0
7218	6¼	Do., do. ¼ shares	6 5 0	5 0 0	7 0 0
5581	6¼	Do., do. do.	2 10 0	5 0 0	2 15 0
2000	25	Exeter	25 0 0	6 10 0	42 0 0
		Falmouth	£ s d	£ s d	£ s d
		Folkestone			
		Gosport			
	20	Gravesend&Milton	20 0 0	3 0 0	14 to 16
		Great Grimsby (L)			
1000	5	Greenock (Shaw's Gravitation)	50 0 0	7 0 0	68 to 70
		Guiseley, n. Leeds.			
		Harrogate			
		Heywood			
1500	10	Kilmarnock	10 0 0	2 0 0	8 0 0
3200	25	Leicester	25 0 0	4 10 0	27 10 0
120	25	Lewes	25 0 0	6 0 0	26 0 0
		Limerick			
1080	25	Lincoln	25 0 0	7 0 0	38 0 0
360	25	Do., new shares	25 0 0	4 5 0	38 0 0
		London Comps.—			
47000	10	Berlin	10 0 0	4 10 0	10¾ to 11½
12000	25	Chelsea	25 0 0	5 5 0	28 to 29
975000	Sk.	East London	Stock	6 0 0	128 to 130
10000	50	Grand Junction	50 0 0	8 0 0	80 to 82
5840	25	Do., ¼ shares	25 0 0	8 0 0	40 to 41
2160	25	Do., new ¼ sh.	10 0 0	7 10 0	
2310	100	Kent	100 0 0	6 0 0	129 to 131
1460	100	Lambeth	100 0 0	6 0 0	110 to 115
4120	50	Do., new shares	50 0 0	6 0 0	51½ to 53
		New River		441 6 8	£17,400
1560	100	New River London		per sh.	
		Bge. Annuities	100 0 0	2 10 0	55 0 0
3036	100	Southwark & Vxll.	100 0 0	6 0 0	126 to 128
3036	25	Do., do.	25 0 0	6 0 0	31½ to 33½
1296	100	Do., do.	100 0 0	5 0 0	104 to 106
1296	100	Do. (1867)	85 0 0	4 10 0	106 to 108
12168	61	West Middlesex	61 0 0	9 8 6	112 to 115
				per sh.	
		Do., new shares.	6 2 0	4 0 0	9 to 9½
		Liskeard			
		Maidstone			
		Maldon (Lim.)			
		Margate			
		Matlock			
550	10	Neath	9 0 0	4 10 0	10 10 0
250000	Sk.	Newcastle-on-Tyne (Whittle Dean)	Stock	5 0 0	93 0 0
9600	6¼	Do., do.	5 0 0	5 0 0	4½ to 4¾
135	20	Newport, Carisbke.	20 0 0	4 10 0	26 0 0
		Newport, Mon.			
		Newry (L.) £6000.	£ s d	£ s d	£ s d
		North Cheshire		10 0 0	7 10 0
		Do.		2 0 0	7 10 0
		North Shields		10 0 0	
		Norwich			
		Nottingham		50 0 0	5 0 0
		Pontypridd (Lim.)			
		Poole District (L.)			
		Portsmouth		10 0 0	6 0 0
		Do.		2 10 0	6 0 0
		Queenstown (L.)		10 0 0	4 0 0
		Do.		2 0 0	4 0 0
		Do., new shares.			
		Ramsey, I. of Man		5 0 0	
		Ramsgate		10 0 0	6 0 0
		Reading			
		Richmond, Surrey			
		Rochdale			
		Rothesay(L.) £7000			
		Royston (L.) £2500			
		Saffron Walden (L.)			
		St. Helen's			
		Scarborough			
		Sheffield			
		Shrewsbury			
		Southport			
		South Staffordsh.		10 0 0	
		Do.		5 0 0	
		Spalding			
		Staffordshire Potts		5 0 0	6 0 0
		Stockport. [boro'			
		Stektn. & Middles-		12 10 0	6 0 0
		Do., A shares.		12 10 0	6 0 0
		Do., B shares.		7 0 0	6 0 0
		Do., C preference		2 0 0	5 0 0
		Sndrland&S. Shlds.		5 0 0	8 0 0
		Tolcross, Lanark			
		Tunbridge Wells			
		Tweedmth (L) £500			
		Wakefield			
		Warrington			
		Wellington, Salop.			
		Weston-sup-Marc.			
		Weymouth			
		Winchester G. & W.			
		Wirral, Cheshire			
		Wolverhmptn New Yeadon (Limited)		5 0 0	4 0 0
		York New Co.		10 0 0	5 0 0

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
			£ s d	£ s d	£ s d
3600	50	Nottingham	50 0 0	5 0 0	60 10 0
99	10	Do.	2 0 0	4 0 0	2 0 0
100	10	Do., new shares.			
400	5	Ramsey, I. of Man	5 0 0		
1500	10	Ramsgate	10 0 0	6 0 0	13 to 13½
		Reading			
		Richmond, Surrey			
		Rochdale			
		Rothesay(L.) £7000			
		Royston (L.) £2500			
		Saffron Walden (L.)			
		St. Helen's			
		Scarborough			
		Sheffield			
		Shrewsbury			
		Southport			
11184	10	South Staffordsh.	10 0 0		11 17 0
2554	10	Do.	5 0 0		
		Spalding			
21000	5	Staffordshire Potts	5 0 0	6 0 0	7 5 0
		Stockport. [boro'			
1800	12½	Stektn. & Middles-	12 10 0	6 0 0	
800	12½	Do., A shares.	12 10 0	6 0 0	
1591	12½	Do., B shares.	7 0 0	6 0 0	
4000	10	Do., C preference	2 0 0	5 0 0	2¾ to 3
26700	5	Sndrland&S. Shlds.	5 0 0	8 0 0	8 17 6
		Tolcross, Lanark			
		Tunbridge Wells			
		Tweedmth (L) £500			
		Wakefield			
		Warrington			
		Wellington, Salop.			
		Weston-sup-Marc.			
		Weymouth			
		Winchester G. & W.			
		Wirral, Cheshire			
20000	5	Wolverhmptn New Yeadon (Limited)	5 0 0	4 0 0	5 0 0
6000	10	York New Co.	10 0 0	5 0 0	11 12 6

The Water-Works in the undermentioned towns belong to private individuals :—

Campbelltown. Chidwall (Lancaster). Hyde (Cheshire). Knaresborough. St. Leonard's. Stamford.

The Water-Works belong to Local Boards of Health, Municipal Corporations, or Commissioners acting under Special Acts of Parliament, in the following towns :—

Aberdeen. Abergavenny. Aberystwith. Alnwick. Ashby-de-la-Zouch. Ashton-under-Lyne. Baildon, Yorkshire. Barnsley. Bath. Belfast. Bilston. Birkenhead. Bishop's Auckland. Bolton.
Bradford, Yorkshire. Brynmaur, Brecon. Burnley. Bury St. Edmund's. Carmarthen. Chelmsford. Chorley. Cork. Coventry. Croydon. Darlington. Dartmouth. Dorchester. Dover.
Dublin. Dumfries. East Stonehouse. Ely. Epsom, Surrey. Farcham, Hants. Glasgow. Gloucester. Greenock. Halifax. Hastings. Haverfordwest. Haworth, Yorkshire. Huddersfield.
Hull. Ilfracombe, Devon. Keighley. King's Lynn. Kirkealdy. Knighton, Radnor. Lancaster. Leamington. Leeds. Leek. Leith. Liverpool. Llandilo. Llanelly.
Lytham. Macclesfield. Maidstone. Manchester. Merthyr Tydvi.. Montrose. Nantwich, Cheshire. Oldham. Oxford. Paisley. Pembroke. Penrith. Penzance. Perth.
Peterhead. Pontefract. Poole. Port Glasgow. Preston. [ness. Pultneytown, Caithness. Rotherham. Rugby. Salford. Salisbury. Sheerness. Shipley. Southampton. Stirling.
Stroud. Swansea. Teignmouth. Tormoham. Warwick. Welchpool. West Cowes. Whitby. Whitehaven. Wigan. Windhill, Yorkshire. Wirksworth. Worcester.

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	4 2 6	3 4 9	3 0 0	3 10 0	3 15 0
1¼ and 2-inch Socket-pipes	7 10 0	6 0 0	6 15 0	6 15 0	7 10 0
2½ and 3-inch ditto	7 0 0	6 0 0	6 5 0	6 10 0	7 0 0
4 and 5-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 10 0
6 inches and upwards ditto	6 5 0	5 0 0	5 10 0	5 15 0	6 5 0
Retorts, 1st fusion, hot blast	6 0 0	—	5 5 0	5 10 0	6 0 0
Ditto, 2nd ditto, cold ditto	7 0 0	5 15 0	5 15 0	6 0 0	7 0 0
Tank-plates, ⅜ thick and above	6 10 0	5 10 0	5 15 0	5 15 0	6 5 0

WROUGHT-IRON TUBING,

Subject to 50 per cent. Discount.

	2 in.	1½ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot		1 0	0 10	0 7	0 5	0 4½
Ditto ditto, from 6 inches to 18 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 6	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

GAS COALS.—*Per Ton.*

Newcastle.—Unscreened :—

Burnhope, East Castle, Haswells, Lanchester's Pelaw, Nettlesworth Primrose, and South Pelaw	6s. 6d.
Dean's Primrose, Felling, North Pelton, Redheugh Main, Walker's Primrose, West Wear, and Whitwell Primrose	6 9
Craghead, Charlaw, Derwent, Edmondsley, Eighton Moor, Hartlepool Pelaw, Holmside, Lambton's Gas, Medomsley, Mickley, New Pelaw, New Pelton, Pelaw Main, Ravensworth, South Moor Pelton, South Leverson, Townley Main, Tyne Main, Washington Hutton, West Pelaw, Wearmouth Hutton, and Witton	7 0
Pearth, Ravensworth Pelaw, Waldridge, West Garesfield, and West Pelton	7 3
Brancepeth, Pelton, South Pearth, Stella, Urpeth, and West Leverson	7 6

Scotch Cannel :—

Boghead (at Leith)	45 0
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	12 6
Lesmahago (at Glasgow)	24 6
Ditto (at Granton)	25 6
Arniston	27 6
Wemyss	20 0
Haywood, Wilsontown (at Granton)	14 0
Pirnie	14 0
Lothian's Cannel (free on board at Leith)	25 0
Myles' Cannel	21 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton :—

Chatham and Rochester	6s. 6d. to 6s. 9d
Cork	9s. 6d. to 10 0
Dover, Folkestone, and Ramsgate	8 0
Dublin	10s. 0d. to 10 6
Exeter Quay	9s. 6d. to 9 6
Ipswich	6 6
London (from Leith)	9 0
London (Pool)	6 6
Lowestoft and Yarmouth	5s. 9d. to 6 0
Portsmouth and Southampton	8 6
Plymouth	9s. 0d. to 9 6
Shoreham	8 0
Whitstable	7 0
Weymouth	9 0

Foreign.—Per Keel :—

Barcelona	23 0
Bordeaux	15 0
Boulogne and Calais	8 0
Cadiz	16 0
Copenhagen	10 10
Genoa	22 10
Hamburg	11 10
Havre de Grace	£10 to 10 5
Leghorn	20 0
Lisbon	14 5
Rotterdam	11 5
Stettin	12 5
Trieste	18 0
Venice	22 0

SUNDRIES.

Best Nstle. Fire-bks., p. 1000, £2. 10s. to £2	15 0
Cliff's Fire-bks. (at Wortley), p. 1000	2 15 0
Ingham's ditto (at Wortley), p. 1000	2 15 0
Fire-clay Retorts, p. ft. run, 5s. 6d. to	0 7
Tough Cake Copper, p. ton	106 0 0
English Pig Lead, p. ton	21 5 0
Welsh Bar Iron (in London), p. ton	7 10 0
Foreign Spelter, p. ton	22 10 0
English Block Tin, p. ton	102 0 0
Banca, p. ton	95 0 0
Tarred Rope Yarn, p. cwt.	1 0 0

GEORGE GLOVER & CO.'S

IMPROVED DRY GAS-METERS,

STANDARD GASHOLDERS, AND TESTING APPARATUS.

Extensive experience, in this country and abroad, has proved the superiority of their Improved Dry Gas-Meters, which have come more rapidly into general use than any Meter hitherto manufactured.—The printed Report of the official Inspector of Gas-Meters for the City of Manchester, for the year ending 1863, shows that he tested 5707 *new Dry* Gas-Meters, and only 5 *new Wet* Meters; and that *George Glover and Co.'s Improved Dry Gas-Meters stand highest in point of accuracy*, as shown in the following extract:—

1862.

CLASSES X. & XXXI.

"George Glover and Co., per centage of error on the number tested, 2·116.

Thomas Glover	,,	,,	,,	2·812.
Croll, Rait, and Co.	,,	,,	,,	5·540.
Thomas Fletcher	,,	,,	,,	15·121.
Joseph Boulton	,,	,,	,,	25·000."

Ranelagh Works, Ranelagh Road (near Pimlico Pier), London, S.W.; and 15, Market Street, Manchester.

THE

GAS-METER COMPANY, LIMITED,

(LATE CROLL, RAIT, & CO.,)

Beg to intimate that the printed report of the official inspector of Gas-Meters for the City of Manchester for the year ending **1864** shows the following comparison:—

NEW METERS TESTED.

Of the Gas-Meter Company, Limited . .	Dry . .	1116	
	Wet* . .	1292	
Total		——	2408
Of George Glover and Co.	Dry		383

* The Unvarying Water-Line Gas-Meter, in regard to which the following extract from said report refers:—"The visiting justices will perceive, from a comparison of the tables now appended with those of last year (viz., 1863), *that there has been a large increase in the number of new wet meters tested, owing to the Gas Committee having substituted the wet for the dry in the case of hired meters.*"

Extract from printed report of the said official inspector for the year ending 1862, shows the following comparison:—

Croll, Rait, and Co., per centage of error on the number tested . . 8·671
George Glover and Co. ,, ,, ,, . . 22·727

CLARIDGE, NORTH, AND CO.,
PHŒNIX FOUNDRY,
BILSTON.
GAS AND WATER PIPES.
Every description of castings to 40 tons each.
LONDON AGENT—MR. V. J. BARTON, 28, MARTIN'S LANE, CANNON STREET.

D. BRUCE PEEBLES,
Gas-Meter Manufacturer,
FOUNTAINBRIDGE,
EDINBURGH.

BEST AND HOBSON,
LATE
ROBERT BEST,
100, CHARLOTTE STREET, BIRMINGHAM,
Manufacturers of
CHANDELIERS, PENDANTS, BRACKETS,
Brass and Iron Gas-Fittings, Steam and Water-Cocks, &c., &c.
Also,
PATENT WELDED IRON TUBES,
For Gas, Steam, Water, and other purposes.
GAS APPARATUS OF EVERY DESCRIPTION.
High-pressure Water-Valves and Cocks, &c., &c.
Plumbers Brassfoundry,
BRASS, COPPER, COMPOSITION, AND LEAD TUBES.
Works: Birmingham, and Great Bridge, Staffordshire.

ROBERT MACLAREN and CO.,
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

WALTER MABON & CO.,
Engineers,
ARDWICK IRON-WORKS,
FAIRFIELD STREET, MANCHESTER,
MANUFACTURERS OF
IRON TANKS, GASHOLDERS,
GAS APPARATUS,
PIPES, VALVES, IRON ROOFS,
WROUGHT AND CAST-IRON GIRDERS.
DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

Established 1830.

THE MOST PERFECT DRY GAS-METER.

N. DEFRIES'S PATENT,

WITH ROTARY VALVE.

200,000 in use.

For Circulars and Testimonials, apply at the Manufactory,

DIANA PLACE, EUSTON ROAD.

TO GAS COMPANIES AND OTHERS HAVING CONTRACTS ABROAD.

WANTED, by the Advertiser, a situation to SUPERINTEND the erection of Gas-Works. Has had 18 years experience in every department connected with the above. Has been in hot climates. Would prefer going abroad again.
Address, W. B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS ENGINEERS.

WANTED, employment as Sub-MANAGER or Yard FOREMAN. Has a thorough knowledge of working and setting iron or brick retorts, carbonizing coal, purifying gas, and all the routine of the works, laying mains and services, repairing meters; and is a thorough good iron fitter.
Address, J. M., 90, FETTER LANE, E.C.

TO GAS COMPANIES.

THE Advertiser is open to an Engage-ment as MANAGER of Gas-Works. Has had several years practical experience in the carbonizing of coals and distribution of gas. Understands retort setting (both clay and iron), main and service laying, fitting, taking quarterly indices of meters, and making out gas accounts. Age 37. Married.
Address, Cs., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, two steady Men as STOKERS.
Applications, stating age and wages required, with references as to character, to be made to the MANAGER.
Gas-Works, Sleaford, Jan. 1, 1866.

WANTED, an Assistant Collector and INSPECTOR. A person thoroughly qualified to act in both capacities. He must devote the whole of his time to the service of the Company. Salary £70 per annum. Security required.
Applicants who have had former experience need only apply, stating former and present engagements, age, &c., enclosing testimonials; to be addressed (in applicant's own handwriting) to the MANAGER, Gas-Works, Swansea, SOUTH WALES.
Dec. 23, 1865.

WANTED, at the Reading Gas-Works, a steady man as FOREMAN. He must fully understand the various duties of the retort-house, and be able to take charge of the engine, exhauster, &c.
Applications, with testimonials, stating wages required and age, to be addressed to the MANAGER of the works.
Reading Gas-Works, Jan. 5, 1866.

TAR DISTILLERY BUSINESS.

DORMANT Partner Wanted. Capital required, £1000 to £3000.
Address, X. Y. Z., care of Mr. King, 11, Bolt Court, FLEET STERT, E.C.

ON SALE, 4 round Dry-Lime PURIFIERS, 6 ft. diameter.
Apply to Mr. LONGWORTH, Gas-Works, DUKINFIELD.

DUKINFIELD GAS COMPANY.

TO IRONFOUNDERS, &c.

THE Directors of the above Company are prepared to receive TENDERS for the erection and completion at Denton, near Manchester, of a GASHOLDER, 80 ft. diameter, and 20 ft. deep. Also for the erection and completion at the Gas-Works, Dukinfield, of 4 DRY-LIME PURIFIERS, each 10 ft. square, with centre valve, lifting apparatus, and every other requisite.
Any further information may be had on application to Mr. Longworth, the Company's Manager.
Tenders, accompanied by plans and specifications, and endorsed "Tender for Gasholder" or "Purifiers," to be delivered to the undersigned not later than Wednesday, the 17th of January, 1866.
WILLIAM LONGWORTH,
Gas Offices, Dukinfield. Manager.

THE
EAST BARNET GAS & WATER
COMPANY, LIMITED.

R. WILKINSON, ESQ., CHAIRMAN.

This Company is formed for the purpose of affording a good supply of gas and water to the inhabitants of East Barnet, Herts, and the surrounding neighbourhood. Acting upon a principle of non-interference with existing interests, the Directors have selected for their operations those districts of East Barnet, Chipping Barnet, Totteridge, and adjacent places thereto in the county of Herts; and Enfield, Friern Barnet, Finchley, and adjacent places thereto in the county of Middlesex which are not at present supplied with gas or water by any other proprietary.

The Directors have entered into a contract with the present proprietors for the purchase of the existing gas-works, including the freehold land, dwelling-house, gasholders, and all outbuildings, as the same are now situate near the Barnet Station of the Great Northern Railway. The vendors have agreed to accept 1000 free fully paid-up shares as in payment of a moiety of the purchase, which shares are not to participate in any dividend until the general body of Shareholders shall have received a dividend of £5 per cent. upon their paid-up capital. The purchase also includes the very valuable plant underlying the numerous roads on the British Land Company and other estates.

The Directors are negotiating with the proprietors of the water-works at East Barnet for the purchase of that valuable concern, and they confidently anticipate that they will succeed in acquiring it upon terms at once equitable and advantageous.

In addition to the sale of gas, the Directors have resolved to supply and erect fittings, services, and meters; so that in every department, whilst the public will secure a good article, manufactured and placed under the most experienced management, the Company will in all matters of detail improve the dividend which the Directors confidently depend on realizing for their constituency.

Coke, tar, and all residual products of the manufacture of gas, will also form a staple of the Company's sales.

In the event of the Directors succeeding in purchasing the water-works, as above intimated, the value of the facilities for laying down double mains for gas and water contemporaneously cannot be over-estimated. In this case, wherever gas is required in an unopened district, water can also be laid on, with a considerable saving of labour and cost.

The Directors have secured the valuable services of Samuel Pontifex, Esq., A.I.C.E., as Managing Director. That gentleman's ability and experience are too well known in the neighbourhood of the works to require comment here.

The Directors have issued the necessary notices of their intention to apply to Parliament in the ensuing session for such powers as are required by all companies similar to this in constitution.

Should no allotment be made, all deposits will be returned in full.

The Directors will proceed to allot first list of applicants for shares on the 10th of January, 1866. The next day for allotment will be duly announced.

Applications for shares can be sent either to the Bankers, Messrs. Glyn, Mills, Currie, and Co.; to the Secretary, at the Gas-Works, East Barnet; or to the City Offices of the Company, 61, Cheapside, E.C.
WM. C. HUMPHRYS, Secretary.

The business will be carried on by the Company on and after the 1st of January, 1866.

IMPROVED Smelting Machines, Cross-Bars and Screws, wrought-iron Retort-Lids, Purifier Riddles, and all descriptions of Gas Apparatus, manufactured by WM. RICHARDSON and SON, Charles Henry Street, BIRMINGHAM.

J. STRACHAN,
CONSULTING GAS ENGINEER,
68, KING'S ROAD, READING,

Having had many years experience in the adjustment and regulation of the supply of gas to public lamps, begs to offer his services to Gas Companies, Corporations, or Boards of Health, on reasonable terms.
Contracts taken for laying mains, general repairs, and extension of gas-works.

JOHNSTON, FRASER, and CO., GLASGOW, are makers, under four patents, of the following:—
THE TRANSLUCENT LAMP, "the most novel and elegant invention since the introduction of gas lighting."
SHADOWLESS HALL LANTERNS.
FESTOONED VESTIBULE LIGHTS.
PLATINIZED STAR LIGHTS } for shops and
CONVEX REFLECTOR LIGHTS } windows.
And other improved appliances for lighting lobbies, public buildings, shops, and warehouses; the aim of the inventions being simplicity and economy in construction, with elegance of form and decoration, and absence of objectionable shadows and obscuration of light.
Illustrated catalogues by post for 1s. 8d. in postage-stamps.

THE CONTINENTAL GAS AND WATER COMPANY, LIMITED.
Issue of DEBENTURES in amounts of £10, £20, £50, and £100, to pay 7½ per cent. Issued at the rate of £80 cash for £100 debenture, one-half to be paid on allotment, and remainder in three months, having interest coupons attached, payable in London half-yearly at the rate of 6 per cent. per annum; a portion of the debentures to be redeemed annually at par by drawings on the 1st of January in each year, commencing 1867; the whole to be paid off during the period of the concession of Port Louis (viz., 25 years).
The above price of issue will give to the holders interest at the rate of 7½ per cent. per annum, and a cash bonus of 25 per cent. on the redemption of the debentures.
These debentures are amply secured on the freehold property and works of the Company—viz., the gas-works at Port Louis, the capital of the British colony of the Mauritius (population, 80,000), and the works at Arras (population, 25,000); and it is estimated that the minimum income from Port Louis alone will be ample to redeem the debentures with interest, and to provide 10 per cent. to the shareholders.
The works at Arras have been in active and profitable operation for nearly three years, and public and private lighting was commenced at Port Louis on the 9th of November.
Further information will be supplied by the Secretary, to whom all applications for debentures are to be addressed.
By order,
HENRY CHALON, Secretary.
60, Gracechurch Street.

EDMUND SMITH,
GRASBROOK, HAMBURG,

would respectfully call the attention of engineers and managers of gas-works to his Newly Improved GAS-METER, patented 1862 in England, and the principal parts of the Continent.
Price-lists and tenders for gas-meters, experimental station-meters, experimental holders, governors, purifiers, gasholders, pressure-gauges, gas and water fittings, &c., are forwarded on application.

CHARLES PANTING,
CONSULTING PRACTICAL ENGINEER,
8, NEW BROAD STREET, LONDON, E.C.

Mr. Panting having had many years experience in designing and manufacturing gas apparatus, is prepared to advise with Companies and others on the laying out of new, and on the extension or improvement of existing gas-works.
Plans, specifications, and estimates furnished.

D. GRANT & CO.,
GAS-METER MANUFACTURERS
(Stamped according to the Sale of Gas Act).
STATION-METERS ANY SIZE.
PHOTOMETERS, EXPERIMENTAL METERS,
PRESSURE-GAUGES, &c.
Price List on application.
GAS-METER WORKS, CROSSCAUSWAY, EDINBURGH.

Established

1795.

JOSEPH CLIFF & SON,
THE ORIGINAL
WORTLEY FIRE-BRICK WORKS,
NEAR LEEDS,
MANUFACTURERS OF ALL DESCRIPTIONS OF
FIRE GOODS, and SALT-GLAZED DRAIN-PIPES.
LONDON AGENT:
MARCUS BOURNE NEWTON,
Wharf No. 4, inside Great Northern Goods Station, King's Cross
Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

THE

GAS-ENGINE COMPANY, LIMITED.

CAPITAL, £100,000, in 5000 Shares of £20 each, of which 4250 are Preference or A Shares, and 750 Deferred or B Shares.

Deposit £1 per Share; on Allotment £1. 10s. and £2. 10s. three months after Allotment; after which there will be no further calls without authority of two General Meetings of Shareholders.

DIRECTORS.

ALEXANDER ANGUS CROLL, C.E., 10, Coleman Street, E.C. (Chairman).
W. T. ADCOCK, Sunnyside, Worcester.
C. J. ANDREWES, Reading Iron-Works, Reading.
THOMAS G. BARLOW, C.E., 42, Parliament Street, S.W.
F. J. EVANS, Engineer-in-Chief of the Chartered Gas Company, Horseferry Road, Westminster.
EBENEZER GODDARD, C.E., Gas-Works, Ipswich.
GEORGE VIRTUE, Ivy Lane, E.C., Director of the Great Central, Surrey, and other Gas Companies.

SOLICITOR.

J. HENRY JOHNSON, 47, Lincoln's Inn Fields, W.C.

AUDITORS.

MESSRS. COLEMAN, TURQUAND, YOUNGS, and CO., 16, Tokenhouse Yard, E.C.

ENGINEER and SECRETARY, pro tem.

ARTHUR KINDER, 20, Cannon Street, E.C.

BANKERS.

THE AGRA AND MASTERMAN'S BANK, LIMITED, Nicholas Lane, E.C.

TEMPORARY OFFICES.

20, CANNON STREET, E.C.

PROSPECTUS.

THIS Company is formed for the introduction, into Great Britain and the Colonies, of the Gas-Engine invented and perfected by M. Lenoir, of Paris, and for which patents have been secured in this country.

By means of the inventions of M. Lenoir, motive power is obtained by the admission of a mixture of coal gas and atmospheric air into the cylinder, where it is ignited by means of electricity. The Engine itself is very simple and inexpensive in construction, and its regular working in Paris and the French provinces, during the last four years, has fully demonstrated its great usefulness and its perfect safety. The insurance offices do not increase the ordinary rates of premium where these Engines are in use.

The Gas-Engine is peculiarly applicable for purposes where a small amount of occasional or intermittent power is required, and where the power to be obtained by steam would be objectionable, such as in small manufactories of all kinds in the centre of towns.

The Gas-Engine has now been introduced into upwards of 300 different manufactories, &c., in France, with uniform success, and, although its use in England has not been very extensive at present, it has been adopted in numerous establishments in London; whilst engineers who are well qualified to judge of the field for its use in this kingdom, agree in stating its applications to be almost illimitable. The following extracts from many of a similar character will show the estimation in which the Engine is held by those who have had it in use for some time:—

Having had one of your Engines at work in my printing establishment for the last twelve months, driving two machines, I have great pleasure in bearing testimony to the utility of the same as a motive power.—(W. SMITH, Printer, 71, Kennington Lane.)

The specimen of Lenoir's patent Gas-Engine deposited in the Patent Office Museum, of the nominal power of half a horse, has been worked most satisfactorily in the workshop of this establishment for the last five months, during which time it has made no less than 2,762,184 revolutions, without the slightest derangement of any of its working parts. I have taken some indicator cards from the top and bottom of the cylinder, and find that, at 110 revolutions per minute, the power given off is just equal to one horse power. This Engine was sold for half a horse-power, and it indicated a power very considerably above.—(F. P. SMITH, Curator, Patent Office Museum.)

We have had for the last month in use one of your Gas-Engines, as the motive power to a Conisbee's Imperial Lithographic Machine, and find it answers exceedingly well. One very great advantage is that the insurance companies with whom we insure—viz., the Manchester Guardian and London and Liverpool—have allowed its use without raising the rate of insurance, which, had we had steam power, would have been more than double.—(DEAN and SON, Lithographers, 65, Ludgate Hill.)

I find the working of the Gas-Engine fitted up for me, for turning my printing-machines, in every way satisfactory. The expense incurred for gas and grease is comparatively trifling. I can get easily 1000 copies per hour.—(A. SOUTHEY, Printer, 146, Fenchurch Street, E.C.)

I am happy to say that, after having had the Gas-Engine in use for upwards of three months, I have every reason to be perfectly satisfied with it.—(J. CARTER, 17, Fleet Street, E.C.)

We have had one of your Engines at work for about six months, and it answers our purpose admirably. It occupies very little space, and is easily managed.—(ANN ECCLES, Printer, 101, Fenchurch Street.)

The Gas-Engine being light in construction, occupying but small space, and absolutely free from danger, may be placed upon any floor of a house, and is at the same time almost noiseless. There is no smoke, steam, or other annoyance arising from its use. The cost of construction of these Engines is small, whilst, from their simplicity, no skilled engineer is required for their working.

The French Company, who are the owners of M. Lenoir's patents, have agreed to assign the British patents to this Company, with their future improvements upon them, in consideration of £10,000 in cash and £15,000 in shares, upon which no dividends become payable until the ordinary shareholders have received dividends to the amount of £10 per cent. per annum upon their investment, in addition to which the directors have power to lay aside a large reserve-fund before a division of profits. As the owners of the patents will retain a large interest in this Company, they will naturally afford every assistance in the introduction of the invention, which their experience in France well enables them to do.

The Reading Iron-Works Company, Limited, have made the Engines at work in this country, and have agreed to supply the public demand for them on fair terms.

The directors do not consider that it will be necessary to call up more than £5 per share, unless it shall hereafter be considered advisable that the Company shall establish works for the manufacture of the Engines.

Although the Gas-Engine has been introduced into this country for twelve months only, and no effort has been made to secure its general adoption, yet the sale has regularly increased, and has now reached such a number as, without further increase, it is calculated will give the shareholders fully £10 per cent. per annum on the amount intended to be called up. The directors, however, confidently expect the sale to be quadrupled within the next two years, in which case the profits must obviously be extremely large.

The Engine may be seen at work daily, from eleven to one, and from three to five, at No. 40, Cranbourn Street, Leicester Square; and, by special appointment, the Engines may be seen regularly working at various establishments.

Prospectuses and Forms of Application for Shares may be had from the Solicitor, the Secretary, and the Bankers.

Just Published, price 1s., or 13 stamps per post.

THE GASFITTERS GUIDE, containing the principles and practice of gas-fitting, with diagrams of fittings.

Address, T. ELDRIDGE, 55, Murray Street, City Road, LONDON.

EIGHTH THOUSAND.

AGRICULTURAL VALUE OF REFUSE GAS LIME.

By PROFESSOR VOELCKER,
Professor of Chemistry to the Royal Agricultural Society of England.

Price 10s. per 100, or by post, 10s. 6d.

London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

NOW READY,

VOL. XIII. of the JOURNAL of GAS LIGHTING, WATER SUPPLY, and SANITARY IMPROVEMENT, for 1864, price 21s., bound in cloth and lettered. A few copies of Vols. II., III., IV., V., VI., VII., VIII., IX., X., XI., and XII. are still on sale.

W. B. KING, 11, Bolt Court, FLEET STREET, E.C.

GAS LEGISLATION, 1865.

Now ready,
Reports of the Proceedings before Select Committees of the House of Commons.

BATH GAS BILL—price 1s., by post 1s. 1d.

KENT GAS BILL—price 1s. 6d., by post 1s. 7d.

PRESTON, EXETER, AND FOLKESTONE GAS BILL—price 1s., by post 1s. 1d.

STROUD GAS (Local Government Supplemental, No. 3) Bill—price 1s., by post 1s. 1d.

Also, price 2s., by post 2s. 1d.,
Reports of the Proceedings before Select Committees of the House of Lords on the

LEAMINGTON, LIVERPOOL, & RAMSBOTTOM GAS BILLS.

HANLEY GAS BILL.

UNITED GENERAL (DUBLIN) GAS BILL.

London: WILLIAM B. KING, 11, Bolt Court, FLEET STREET, E.C.

RUTTER ON GAS LIGHTING.

Just Published, Fcap. 8vo., toned paper, pp. 71, sewed, price 6d.,

ADVANTAGES of GAS in PRIVATE HOUSES.

A HANDY BOOK FOR GAS CONSUMERS:
TELLING THEM WHAT TO DO,
AND WHAT NOT TO DO.

BY J. O. N. RUTTER, F.R.A.S.

A new and revised edition, and the 193rd thousand.

LONDON:
VIRTUE BROTHERS AND CO., 1, AMEN CORNER, PATERNOSTER ROW, and all Booksellers. 1865.

A cheaper edition (the 194th thousand), on plain paper, but in all other respects the same as the above, and which is intended for distribution by gas companies, is also ready, price £12. 12s. per 1000 copies, and £1. 7s. 6d. per 100.

Crown 16mo, pp. 20,

GAS IN DWELLING-HOUSES: ITS USES, CONVENIENCES, AND ECONOMY.

A revised and enlarged edition, and the 50th thousand.

Price—1000 copies, £3. 10s.; 500 copies, £1. 17s. 6d.; any smaller number at 8s. 6d. per 100.

When 1000 copies are ordered, the official title, scale of prices, and other information relating to the business of the Company, will be printed on the covers without extra charge.

All orders and inquiries for the two last-mentioned editions to be addressed, direct, to the AUTHOR, Black Rock, BRIGHTON.

SHALE-FIELD TO LET.

THE SHALE-FIELD of WEST-FIELD, in the co. of FIFE, containing a seam of shale rich in oil, WILL BE LET for such a number of years as may be agreed on. A rough coal, well suited for decomposing the shale, will be let along with it. It is situated on the lands of Capledrae, well known for their rich gas-coal, which produces the largest quantity of oil of any coal in Scotland, except Boghead.

Apply to the Proprietors, J. and R. AYTOUN, 3, Fettes Row, EDINBURGH.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Goods.

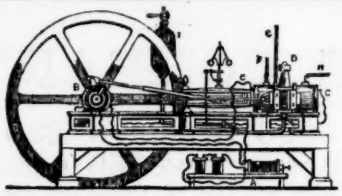
ESTABLISHED 1827.

JOHN BEVERLEY and SON,
MARK LANE, LEEDS.

Manufacturers of Patent Metallic Wet Gas-Meters, Station-Meters, Experiment-Meters, Governors, Pressure-Gauges, Syphon-Pumps, &c.

Inventors and sole manufacturers of Beverley's double-cased Gas Cooking Apparatus, unequalled in economy, comfort, and cleanliness.

Meters of any maker altered and put into complete repair, to meet the requirements of the Sale of Gas Act.



THE LENOIR GAS-ENGINE.

A number of these useful and economical engines to be seen in actual work in town and country. Being free from all danger, they can be used where steam power is totally inadmissible.

Exhibition and every information supplied at 40, Cranbourne Street, LEICESTER SQUARE, W.C.

SAMUEL CUTLER, Gasholder
MAKER and CONTRACTOR

For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.

PROVIDENCE IRON WORKS,
MILL WALL, POPLAR, LONDON, E.

Main Laying and Gas-Works erected complete.

OXIDE OF IRON,

We are prepared to supply, on moderate terms,

HYDRATED PEROXIDE OF IRON (BOG OCHRE),

Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.

FRANCIS RITCHIE & SONS,
BELFAST.

WOLVERHAMPTON RETORT WORKS.

ESTABLISHED **1840.**

JOHN EUNSON AND SON,

GAS ENGINEERS, AND MANUFACTURERS OF CLAY RETORTS,
AND FIRE GOODS IN GENERAL,

WOLVERHAMPTON.

Retort Mouthpieces, Bolts, Nuts, and every description of Wrought-Iron Work.

WALTER FORD,

159, GRAY'S INN ROAD, LONDON.

MANUFACTURER OF WET AND DRY GAS-METERS, STATION-METERS, GOVERNORS, &c. &c.

Sole Manufacturer of **PADDON'S PATENT STREET-LAMP REGULATORS,** for insuring any required consumption. These Regulators are in general and increasing use, and references can be given to Gas Companies who use them for every Lamp.

WALKERS'

WOOD PURIFIER SIEVES OR GRIDS.

These celebrated Sieves, used for either Lime or Oxide, are of the most DURABLE KIND, STRONG AND UNDAMAGEABLE, and do not warp. The most satisfactory references can be given by the numerous large and small gas companies who use them extensively.

They are made by Machinery invented for the purpose of the best Woods, FROM TREES SELECTED EXPRESSLY by

C. AND W. WALKER,
AT THEIR MIDLAND WORKS, DONNINGTON, NEWPORT, SHROPSHIRE.
OFFICE: LITTLE SUTTON STREET, LONDON, E.C.

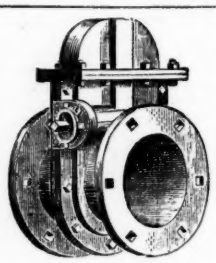
MARTIN'S

LEE MOOR PORCELAIN FIRE-BRICKS,

Containing no Lime, and only ·45 of Oxides, resist the strongest heats, and will last for Gas-Works longer than any others.

Samples and prices sent, and the highest references given, on application to

MARTIN BROTHERS,
ST. AUSTELL, CORNWALL.



REDUCED PRICES OF

BRYAN DONKIN & CO.'S

IMPROVED GAS VALVES

WITH WROUGHT-IRON PINIONS

from 2 inches to 18 inches, price 9s. 6d. to 12s. per inch diameter

List of prices, with full dimensions of all sizes up to 36 inches, to be had on application.

These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.

Valves made with Outside Racks to order. Also, Screw Water-Valves with Gun-Metal Faces.

BRYAN DONKIN & CO.,
ENGINEERS,
NEAR GRANGE ROAD, BERMONDSEY.

F. & C. OSLER,

45, OXFORD STREET, LONDON;

Manufactory—Broad Street, Birmingham—Established 1807,

MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.

ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards (Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

JOSEPH BOULTON,

80, KING'S CROSS ROAD, AND

10½, GREAT PERCY STREET, CLERKENWELL.

Manufacturer of the Patent Dry and Improved Unvarying Water-Line Gas-Meters and Station-Meters, Governors, Experimental Meters, and Pressure Gauges, on the most improved principle.

Old Meters thoroughly repaired, and altered to meet the requirements of the Act of Parliament.

ALL METERS WARRANTED.

GAS & GENERAL ENGINEERING OFFICES,
53 FREDERICK STREET, EDINBURGH.

MR. JOHN ROMANS, Civil and Practical Engineer, may be consulted at the above address on all matters pertaining to Gas-Works, Water-Works, and other Engineering questions.

Plans and Specifications Furnished, Works Erected and Repaired, or taken on Lease for a term of years.

Mr. Romans is also agent in Edinburgh for supplying High-Classed Scottish Cannel Coal and Fire-Clay Goods.

GREAT FIRE
in Tredegar, Monmouthshire.
Another Proof of the Security of
C. H. GRIFFITH'S FIRE & THIEF PROOF SAFES.

[COPY OF LETTER.]

"Mr. Griffiths, *Tredegar, April* 7, 1865.

"Sir,—I have much pleasure in stating that the 'Fire-Proof Safe' you made me about three years since, has been the means of preserving the whole of my books, valuable documents, &c., from the disastrous fire which consumed my premises on the 24th of last month. Although exposed for hours to the most intense heat, the Safe opened without much difficulty.

"Have the goodness to forward me another as soon as possible, and oblige

"Yours very respectfully,

"To Mr. C. H. Griffiths, "E. HORLICK.
"Fire-Proof Safe Manufacturer,
"23, Cannon Street West.

"P.S.—You have my sanction to use this in any way you think proper, not only for your benefit, but that of the public."

INTERNATIONAL EXHIBITION,
1862. CLASS X.
PRIZE MEDAL
For excellence of Fire-Clay Gas Retorts, and
"HONOURABLE MENTION" for
good quality of Fire-Bricks.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE,
MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE-BRICKS, CLAY RETORT
&c. &c.
RETORT MOUTHPIECES, BOLTS, NUTS, &c.

STOURBRIDGE FIRE-CLAY WORKS.

E. BAKER & CO.,
24 WHARF, HARROW ROAD, PADDINGTON, W.

FIRE-BRICKS, LUMPS, SQUARES, and TILES of all dimensions.
GAS-RETORTS always in stock.
GARDEN EDGINGS of various patterns.
ORNAMENTAL BUILDING BRICKS.
GRATE BACKS in various designs.
Contracts entered into to set Retorts, erect Furnaces, &c.
Shipments on the shortest notice.

THOMAS CARR & SON,
MANUFACTURERS OF
FIRE-BRICKS, LUMPS, TILES, RETORTS,
&c. &c.
SCOTSWOOD FIRE-BRICK WORKS,
NEAR
BLAYDON-ON-TYNE.

HARRIS and PEARSON,
PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY
MANUFACTURERS OF
FIRE BRICKS, GAS RETORTS, &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS,
STOURBRIDGE.
Late in the occupation of I. and W. King.
Originally J. Pidcock, Esq.

NB A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches. 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

HANCOCK'S INDIA-RUBBER GAS-TUBING.

All sizes, from ¼ in. to 4 in. diameter and upwards.
Also,
INDIA-RUBBER BAGS for GAS-MAINS.
WASHERS for GAS and STEAM JOINTS.
VALVES (pure solid Rubber) for STEAM-ENGINES.
PACKING (Roll or Sheet) for STEAM-ENGINES.
STRAPS (Rubber and Canvas) for DRIVING MACHINERY.
HOSE-PIPES to convey HOT or COLD WATER.
COKE-HOSE, made specially for rough usage.
GAUGE GLASS RINGS and WASHERS.
SUCTION and DELIVERY HOSE-PIPES for PUMPS, FIRE-ENGINES, BREWERIES, and FACTORY purposes.
BRASS JETS, STOP-COCKS, SPREADERS, and UNION CONNECTING-JOINTS fitted to ditto.
Illustrated Price-Lists on application.

JAMES LYNE HANCOCK,
Vulcanized India-Rubber Works,
GOSWELL MEWS, AND 266, GOSWELL ROAD
LONDON, E.C.

Trade Mark. **THE MEDAL FOR 1862.**

THE ONLY PRIZE MEDAL AWARDED FOR TUBES AND FITTINGS.

CROWN TUBE-WORKS,
WEDNESBURY, STAFFORDSHIRE.
WAREHOUSE—81, UPPER GROUND ST., LONDON.
JAMES RUSSELL & SONS,
Patentees and First Makers of Wrought-Iron Tubes.

W. J. HOLLANDS,
IRON MERCHANT,
31, BANKSIDE, LONDON, S.E.
SOCKET, FLANGE, HOT-WATER PIPES, AND ALL CONNEXIONS; RETORTS, HYDRAULIC MAIN, LAMP-COLUMNS, &c.; AND EVERY DESCRIPTION OF CASTINGS AND WROUGHT-IRON-WORK FOR GAS AND WATER-WORKS, STEAM, AND GENERAL PURPOSES.
N.B.—All goods kept in stock, and supplied at wholesale prices. Estimates given, and orders by post punctually attended to the same day.

BIRTLEY IRON WORKS
CHESTER-LE-STREET,
DURHAM.
Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.
Warehouse in London for Cast-iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.
Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

ALFRED PENNY, Gas and
CONSULTING ENGINEER,
WENLOCK IRON WORKS,
21 & 22, WHARF ROAD, CITY ROAD, LONDON.
Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.
Plans, Specifications, and Estimates prepared.

BELGIAN CLAY RETORTS.
J. SUGG and CO., late ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.
Communications, addressed to J. SUGG and Co., GHENT, will receive immediate attention.

GLOBE METER-WORKS, OLDHAM.
NEWTON & BRADDOCK,
Manufacturers of
IMPROVED CONSUMERS GAS-METERS,
STATION-METERS, GOVERNORS, GAUGES, &c.
Sole Manufacturers of their
PATENT COMPENSATING GAS-METER,
This Patent being applicable for the repair of old Meters.
STATION-METERS,
of any size, on the best principle.

CATHELS'S Patent Four-Way Disc GAS-VALVES, applied to Purifiers, Gasholders, or other apparatus, save from ONE-HALF to TWO-THIRDS the number of ordinary Valves and Connexions. They are simple, strong, and durable; and having no ground faces or rubbing surfaces, cannot get set fast however long they may remain unmoved. The direction in which the Gas is passing can also be seen at a glance.
Illustrated Circulars, Prices, &c., furnished on application to Mr. E. S. CATHELS, Gas-Works, SHREWSBURY.

TO GAS ENGINEERS AND OTHERS
CONNECTED WITH GAS COMPANIES WORKS.

WOOD SIEVES for Gas Purifiers.

BENJAMIN CARPENTER begs to inform the above that he has been supplying most of the principal Gas Companies Works in London, &c., with WOOD PURIFYING SIEVES for the last four years; and, he feels sure, he has given every satisfaction, by the continued favour he has received from gentlemen knowing the benefit derived by their use.
Having, through the introduction of improved machinery, effected a great saving in their manufacture, he is now enabled to offer them at a very Low Price. Being perfectly satisfied of their Superiority over all other descriptions, on account of their Strength, Cheapness, Durability, Non-Liability of Corrosion, and Facility of Cleaning, and having devoted four years to the Perfection of this article, he feels that nothing has been lost sight of in their manufacture which would tend towards Durability and Efficacy.
The Trade supplied, and Orders executed on the shortest notice.
Estimates forwarded on application to
BENJAMIN CARPENTER,
Wood Sieve Maker for Gas Purifiers,
14, JOHN STREET, RODNEY STREET,
PENTONVILLE ROAD, LONDON, N.

FREDERICK RICHARDS,
CONSULTING AND GENERAL ENGINEER,
WILMSLOW, CHESHIRE.
Plans, Specifications, and Estimates made for New or the Alteration of existing Gas-Works.
Gas-Works leased, or Estimates given for the Manufacture of Gas per Contract for a term of years.
Manchester Office: 8, Cateaton Street.

GAS COAL.
MESSRS. RICHARD EVANS & CO., Haydock Collieries, near St. Helen's, are prepared to SUPPLY their best GAS COAL to Gas Companies on favourable terms.
This Coal is extensively used by some of the largest Gas Companies in the Kingdom.
It produces 9,400 cubic feet of 17-candle power, and yields 13 cwt. of coke per ton.

JAMES NEWTON & SONS,
(Established 1820,)
FIRE-BRICK AND TILE MERCHANTS,
Wholesale and for Exportation,
FALCON DOCK, 78 AND 79, BANKSIDE,
SOUTHWARK, LONDON, S.E.,
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
GAS AND WATER WORKS.

J. T. B. PORTER & CO.,
GAS ENGINEERS,
MANUFACTURERS AND CONTRACTORS FOR GAS-WORKS
Of any extent at Home and Abroad,
GOWTS BRIDGE WORKS, LINCOLN,
AND
JOHN STREET, ADELPHI, LONDON, W.C.

JAMES MILNE & SON,
AS ENGINEERS, GAS-METER, GAS APPARATUS, AND GASFITTINGS MANUFACTURERS,
EDINBURGH,
& 2, KING EDWARD STREET, NEWGATE STREET, LONDON.

Station-Meters, Governors, Consumers Meters, Gas Lustres, Chandeliers, Brackets, &c., and every description of Gasfittings and Gas Apparatus.

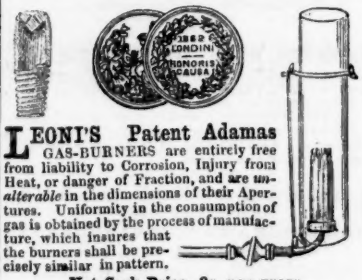
JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water-Works, including Iron Retorts, Socks and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.
N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.
CHARLES HORSLEY, Agent.

FRASER'S PATENT RIBBED CAST-IRON RETORTS are being introduced at the Gas-Works, Derby, Shrewsbury, Portsea, Nottingham, Syston, Whitwick, Barrow-in-Furness, Seaham, Risborough, Leighton, Loughborough, Corwen, Castle Donnington, Kegworth, Royston, Woking, Swadlincote, Rugby, Carlow in Ireland, Stornoway, N.B.; also at Gibraltar and Montreal, &c.
Apply to Mr. A. C. FRASER, Gas-Works, LOUGHBOROUGH.

ECONOMY IN GAS MAKIN .
GREATER BRILLIANCY OF LIGHT,
LESS SMOKE,
AND
NO NAPHTHALINE,
by using
WARNER'S PATENT ANHYDROUS OXIDE OF IRON,
Which, in addition to purifying Gas from all the Sulphuretted Hydrogen and Carbonic Acid, decomposes at the same time the whole of the
AMMONIA,
and a portion of the Bi-sulphide of Carbon.
This is the only material yet discovered which will decompose all the "Ammonia" contained in crude or unwashed Gas.
The Hydrogen liberated through the decomposition of the Ammonia unites with the excess of carbon, and gives an increased yield of Gas of from 10 to 15 per cent., of greater brilliancy of light and with less smoke.
The Oxide can be renovated by simple exposure to the air.
LONDON OFFICES, 17, LAURENCE POUNTNEY LANE.

WARNER'S SILICATE OF IRON PAINT.
This Paint, which is suitable for every description of work, is not affected by Sea Water, or by the Strongest Acids, and, being incorrodible, is much superior to the Oxides of Iron at present in use, they being, in fact, rusts themselves.
LONDON OFFICES, 17, LAURENCE POUNTNEY LANE, E.C.

NATURAL
HYDRATED OXIDE of IRON
constantly on Sale. Apply to
MARTYN DENNIS AND CO.,
LIVERPOOL.

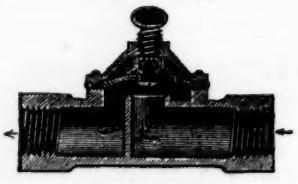


LEONI'S Patent Adamas GAS-BURNERS are entirely free from liability to Corrosion, Injury from Heat, or danger of Fraction, and are *unalterable* in the dimensions of their Apertures. Uniformity in the consumption of gas is obtained by the process of manufacture, which insures that the burners shall be precisely similar in pattern.

Net Cash Price, 8s. per gross.
Patentee and Sole Manufacturer, S. LEONI, 34, St. Paul Street, New North Road, LONDON, N.

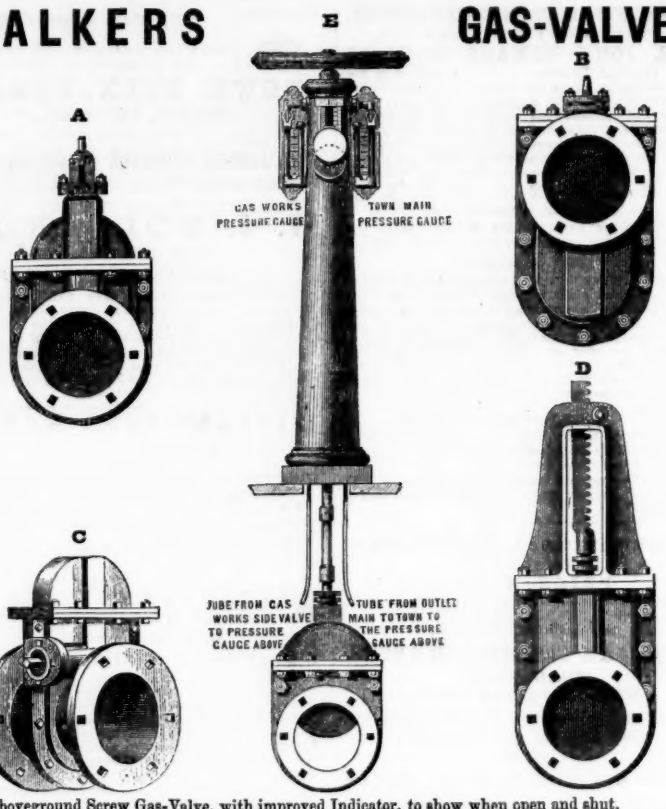
THOMAS LAMBERT & SON,
SHORT STREET, LAMBETH, LONDON.

CARTER'S SAFETY GAS-VALVES,
Made to suit every Description of Fittings.
Section of Valve open.



Manufacturers of
WROUGHT-IRON PIPES AND FITTINGS,
SLUICE-VALVES AND STOP-COCKS,
STOCKS, TAPS, & DIES,
CHANDELIERS, PENDANTS, &c.
PATENT MERCURIAL GAS-REGULATORS.

WALKERS **GAS-VALVES.**



A—Aboveground Screw Gas-Valve, with improved Indicator, to show when open and shut.
B—Underground Screw Gas-Valve, for shallow Street-Mains, made with or without an Indicator.
C—Internal Rack-Valve, with wrought-iron Pinions and machine-cut Teeth.
D—Ordinary Rack and Pinion-Valve, with strong, undamageable Racks and Pinions—made as shown, or boxed up for Street-Mains.
E—Regulating Indicating Column and Valve, for governing the supply of Gas to the Town.

LITTLE SUTTON STREET, LONDON, E.C.

EDWARD COCKEY & SONS,
IRON-WORKS, FROME SELWOOD,
PATENT GAS-VALVES.
A PRIZE MEDAL

WAS AWARDED TO THE PATENTEES AT THE INTERNATIONAL EXHIBITION OF 1862.

These Valves are formed of two cylinders, working one on the other horizontally, having their faces ground perfectly gas-tight.

They are adapted either as central valves, for two, three, or four purifiers—as bye-passes—or as inlet and outlet-valves for gasholders.

They have been tested for five years, and are in use in many important Gas-Works in various parts of the Kingdom. About ninety of them have been fixed, and the most satisfactory reports of their advantages continue to be received.

The simplicity of their construction and the ease with which they are managed are strong recommendations in Gas-Works. The index enables the manager of the works to see at a glance the direction in which the gas is passing.

The time which they have been in use proves their durability; and if, in course of many years, the faces should leak, they can be easily reground without removal from their places, and made as tight as when new.

NOTICE OF REMOVAL.

THE BUSINESS OF
WILLIAM SUGG,
GAS ENGINEER,
is removed to his New Factory,
VINCENT WORKS, VINCENT STREET,
REGENT STREET, WESTMINSTER.

GEORGE ANDERSON, Gas and Consulting Engineer,

16, ADAM STREET, ADELPHI, LONDON, W.C.

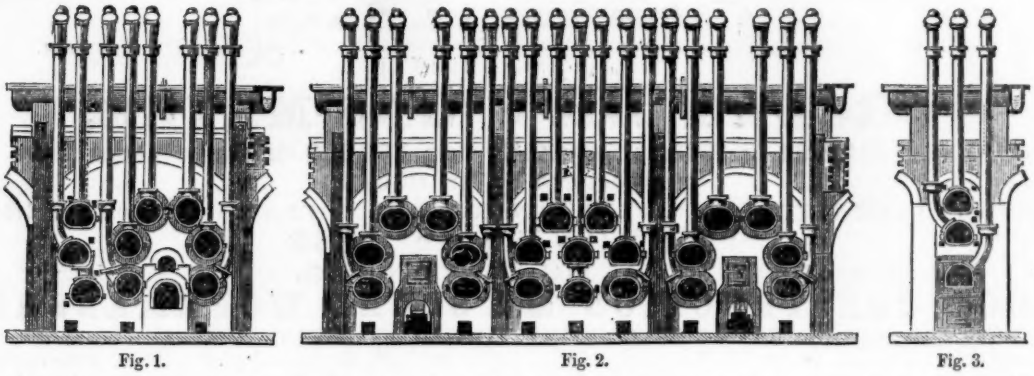


Fig. 1. Fig. 2. Fig. 3.

Fig. 1 represents an arrangement for medium sized works. Either the whole 9 or only 6 of the Retorts may be heated by the alteration of two dampers. Fig. 2. The Retorts in the centre bed are of iron, and receive the modified heat from the beds of Clay Retorts on either side.

In both figs. 1 and 2 all the furnaces, or a portion of them, may be of tar or coke. The tar furnace is adapted to burn *only* tar; and, without smoke or destruction of the Retorts, a tar furnace can be converted to a coke one, or *vice versâ*, without interfering with the Retorts.

Fig. 3 is what I adopt for small works. In it, like fig. 1, 2 or 3 Retorts can be heated by the alteration of two dampers. In each case this very often postpones for weeks, if it does not prevent altogether, the lighting up of an extra fire. These modes of setting can in most cases be adapted to existing arches.

Contracts made for the erection of the Retorts if necessary.

Also my PATENT PISTON EXHAUSTER combined with Steam Engine when required.

Also my PATENT FOUR-WAY VALVES, *one* of which answers the purpose of *three* ordinary Valves when applied to Purifiers, or bye-pass and shut-off to Station-Meters, &c., and obviates the objection of foul gas attendant on the Centre Water-Valve.

Also my CONCENTRIC GAS GOVERNOR, which occupies about half the space of the old-fashioned Governor.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES & FITTINGS,

PLAIN, GALVANIZED, & ENAMELLED, for Gas, Steam, and Water, from ⅛ in. to 6 in. bore.

STOCKS, TAPS, and DIES, GUN METAL GLAND-COCKS, WATER-GAUGES, &c.;

PATENT LAP-WELDED IRON TUBES,

For Locomotive and Marine Boilers, &c.

LONDON WAREHOUSE—Nº 66, QUEEN STREET, E.C.

E. J. & J. PEARSON,

DELPH & TINTAM ABBEY FIRE-CLAY & BRICK-WORKS,

STOURBRIDGE,

PROPRIETORS OF

BEST GLASS-HOUSE POT & CRUCIBLE CLAY;

MANUFACTURERS OF

GLASS-HOUSE POTS, CRUCIBLES, GAS-RETORTS, & FIRE-BRICKS OF EVERY DESCRIPTION.

TO GAS COMPANIES AND THE TRADE.

NOTICE OF REMOVAL IN CONSEQUENCE OF THE LATE FIRE.

J. DEFRIES AND SONS,

Gas Engineers, and Manufacturers of

CRYSTAL, BRONZED, & ORMOLU Chandeliers;

IMPROVED CRYSTAL STAR & SUN LIGHTS;

VESTIBULES, and every description of Gas-Fittings.

Temporary Show-Rooms:—16 & 17, COMMERCIAL STREET, WHITECHAPEL,

Five Minutes Walk from their late Establishment, 147, HOUNDSDITCH.

J. D. & SONS beg most respectfully to inform Gas Companies and the Trade that their CITY SHOW-ROOMS are now complete with every description of Lighting Mediums, including Registered Designs of Mediæval Gas-Fittings, Crystal, Bronzed, Ormolu, and Electro-Plated Chandeliers, Brackets, Vestibule-Lights, Bronzed and Gilt Statuettes.

Special Designs prepared in perfect accordance with architectural arrangements. Estimates furnished for the Lighting and Fitting up of Theatres, Music-Halls, and Public or Private Buildings with Gas.

GAS-MOONS of the Newest Designs.

The PATENT GAS-REGULATOR and PURIFIER reduced to **6s. 6d. per dozen.** *Pattern-Books of Gas-Fittings, Crystal and Ormolu Chandeliers for* 1865-66 *are now complete.*

Works: LONDON and BIRMINGHAM.

The CRYSTAL CEILING, with Ventilating Apparatus, manufactured by J. Defries and Sons for the Strand Music-Hall.

THE

GAS-METER COMPANY, LIMITED,

A. ANGUS CROLL, C.E., Chairman.

GEORGE RAIT, MANAGING DIRECTOR. T. G. BARLOW, C.E., CONSULTING ENGINEER.

CROLL'S DRY GAS-METER,

(Invented and Patented in 1844, since which time 200,000 of these Meters have been manufactured by Mr. CROLL,)

Obtained **PRIZE MEDALS** at the EXHIBITIONS of London, 1851, of New York, 1853, and Paris, 1855.

IMPROVED in 1858,

And was awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for

"GOOD CONSTRUCTION and SOUND WORKMANSHIP."

Now manufactured by the GAS-METER COMPANY, LIMITED, KINGSLAND ROAD, LONDON; and, for the purpose of obtaining greater accuracy in all its parts, the most perfect machinery has been adopted, "By which the construction of the Meter is much simplified, while its liability to get out of order is diminished." (See report of T. G. BARLOW, Esq., C.E.)

ALEXANDER WRIGHT,

55 and 55A, MILLBANK STREET, WESTMINSTER, S.W.,

MANUFACTURER OF

COMPENSATING & OTHER WET & IMPROVED DRY GAS-METERS,

Of the best material and workmanship, carefully adjusted to meet the requirements of the SALES OF GAS ACT.

STATION-METERS & GOVERNORS,

WRIGHT'S REGISTERING PRESSURE-GAUGE, EXHAUSTER REGISTER, & REGULATOR;

STANDARD TEST GASHOLDERS;

Consumers' Governors; Inspectors' Pocket, King's, and all other kinds of Pressure-Gauges; Thermometers for Condensers, Pressure Registers, &c., &c.

EXPERIMENTAL TESTING APPARATUS,

Employed by the best experimenters in this country and on the continent, and by the Gas Testers in the London districts.

PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, BI-SULPHURET OF CARBON TEST, THOMPSON'S BROMINE AND HEATING POWER OF FUEL TESTS, IMPROVED ALKALIMETER, EXPERIMENTAL METERS AND GOVERNORS, MINUTE CLOCKS, &c., &c.

"ANALYSIS OF GAS FOR PRACTICAL MEN,"

New and Enlarged Edition, with "Gas-Meter Testing under Sales of Gas Act," p.p. 25 Stamps.

R. LAIDLAW & SON,

GAS ENGINEERS, IRON & BRASS FOUNDERS

Alliance Foundry, 147, East Milton Street, and Barrowfield Iron-Works,

GLASGOW;

AND AT SIMON SQUARE, EDINBURGH;

MANUFACTURERS OF

STATION & CONSUMERS METERS, ALL SIZES;

WROUGHT-IRON TUBES, FOR GAS, WATER, & STEAM; CAST-IRON RETORTS & PIPES,

HYDRAULIC MAINS, CONDENSERS, WASHERS, SCRUBBERS, PURIFIERS, & TANKS.

GASHOLDERS;

GOVERNORS, SLIDE-VALVES, &c.;

WROUGHT & CAST IRON ROOFS & HOUSES.

Contractors for Gas-Works of any Magnitude. *Plans, Specifications, and Estimates furnished.*

LONDON ESTABLISHMENT—190, STRAND.

D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,

PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR,

invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

MANUFACTURERS OF

GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, VESTIBULES, BRACKETS, PENDANTS;

DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.;

IMPROVED FULL-WAY CARTER'S VALVES (much approved of);

GAS-STOVES, and every article connected with Gas Apparatus.

CAST & WROUGHT-IRON PIPE BLACK & GALVANIZED. COPPER, TIN, BRASS, & COMPOSITION TUBING.

D. HULETT'S IMPROVED SERVICE CLEANSER

for clearing out Mains, Services, and Interior Fittings—65s. net.

Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.

Sole Manufacturers of Church and Mann's Photometer.

Large Pattern Books with every description of Gas-Fittings, Chandeliers, &c., with complete Book of Prices, 12s.

London: Printed by WILLIAM BOUGHTON KING (at the Office of Clayton and Co., 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, January 9, 1866.